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MEDICAL MANAGEMENT OF HEMORRHAGIC FEVER

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Hemorrhagic fever is a perplexing problem, which thus far has been only partially solved. The causative organism, vector, and mode of transmission have not been defined. Many of the clinical and pathological findings are bizarre and unusual. Pathological physiology is puzzling. The spotty geographic incidence, the semiyearly outbreaks, and the limited endemic areas are all remarkable facets. The therapeutic management of the condition has proved equally perplexing. All measures that normally would be expected to be effective have been disappointing. No single agent has been shown to have dramatic effect. In fact, antibiotics, corticotropin (ACTH), cortisone, convalescent serum, convalescent whole blood, and the galaxy of agents used in the hemorrhagic diatheses have failed to have significant effect. Clinical management has resolved itself essentially into symptomatic care plus some measures that at first glance seem unphysiological, yet have reduced the death rate to 4%.

The acute febrile phase of this condition starts abruptly and lasts three to six days. It is characterized by periorbital frontal headache, high fever, chills, diaphoresis, thirst, malaise, fatigue, insomnia, restlessness, eye pain, photophobia, coryza, nasal congestion, cough, anorexia, nausea, vomiting, abdominal pain, myalgia, arthralgia, and low backache. During this phase, rest in bed and sedation are usually adequate symptomatic therapy. The liberal administration of meperidine hydrochloride has satisfactorily controlled headache, pain, restlessness, and vomiting. Acetylsalicylic acid, alcohol rubs, and ice compresses have been used in the management of patients with high temperatures, 105 to 106.2 F. Early controlled fluid intake on the basis of intake and output records prevents excessive edema that complicates the shock, hemorrhagic, and oliguric phases that follow.

There is clinical, laboratory, and pathological evidence of cardiovascular involvement in hemorrhagic fever. Capillary dilatation produces the flushed face and neck, hyperemic mucous membranes, conjunctival injection, and intense congestion of such organs as the stomach, kidneys, and spleen. Increased capillary permeability results in hemoconcentration and edema, the latter being especially evident in the periorbital, conjunctival, retroperitoneal, and pulmonary tissues. Capillary fragility is increased and leads to hemorrhagic phenomena. At postmortem examinations, the heart often is flabby and has subendocardial hemorrhage of the right auricle. Clinically, dilatation of the heart, cardiac arrhythmias, and heart sounds of poor quality have been noted with corroborative x-ray and electrocardiographic findings. Bradycardia is common in the second week of the disease, and decreased peripheral vascular resistance is manifested by wide pulse pressures and low diastolic pressures during early convalescence. Blood pressure lability exists throughout the acute disease. Hypotension usually occurs at the end of the acute febrile phase (third to sixth day of illness), while hypertension occurs during the oliguric phase; however, hypotensive episodes can occur during any stage of the acute disease.

SHOCK

Shock results when cardiovascular involvement is severe. It usually occurs during the acute febrile phase. Pulse pressure narrows to 15 or less; and blood pressure falls rapidly, e. g., 100/80 mm. Hg to 80/65 to 60/50 to 40/32 to imperceptible. The temperature falls as peripheral vasoconstriction, cold clammy skin, and cyanosis develop. The patient hyperventilates and is apprehensive, complaining of weakness and dizziness. Heart sounds become distant and of poor quality as tachycardia appears, and the peripheral pulse becomes "thready" or imperceptible. Most of the deaths due to hemorrhagic fever have occurred in association with shock that did not

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The method of management described in this paper is based on clinical experience with more than 1,000 patients in Korea, over half of these at the Hemorrhagic Fever Center. This center was established April 6, 1952, by the Surgeon, Eighth United States Army, and the Chief Surgeon, Far East Command.

respond to treatment at this phase of the disease. In less severe cases, the temperature falls and the blood pressure may fall to such levels as 80/60; but signs and symptoms of shock are minimal, and the blood pressure gradually returns to normal in 12 to 48 hours. In mild cases, there may be only potential shock as indicated by occasional pulse pressures of 25 or less, normal or low temperature, and symptoms of dizziness and weakness on exertion.

Clinically, a prolonged hypotensive phase with severe shock has often been associated with the following: a preceding, prolonged acute phase with high temperature; continued daily activities of the patient during the acute phase with consequent delayed initiation of medical care; traumatic or prolonged medical evacuation; and severe edema following excessive parenteral or oral intake. In addition, these factors have been associated with increased severity of hemorrhagic manifestations. In the presence of a significant amount of bleeding, shock due to blood loss accentuates the usual shock phase of the disease, and such blood loss may be obscured by hemoconcentration, which is the result of increased capillary permeability. It is not uncommon for patients whose disease is complicated by these factors to be admitted into medical installations in shock.

The knowledge of the complicating factors of shock in hemorrhagic fever points to prophylactic measures in the management of the early phase, which will keep shock manifestations to a minimum. At the earliest suspicion of the diagnosis of hemorrhagic fever, prompt and nontraumatic evacuation to a nearby hospital should be initiated. Evacuation should be by litter and under conditions of complete rest. Fluid management is important from the onset of illness because of the association of edema with increased severity of shock and hemorrhagic manifestations. Febrile patients are thirsty and drink large quantities of fluid if unchecked. The unrecognized hemorrhagic fever patient may be encouraged to take fluids or may be given intravenous fluids for fever and apparent dehydration. Because of the sieve-like nature of the cardiovascular system, such intake results in increased edema. Emphasis is placed on the following signs and symptoms, which have been correlated clinically and pathologically with the presence of edema: conjunctival edema, periorbital edema, pulmonary edema, blurred vision, back pain, periumbilical pain, enlarged liver or spleen, hiccoughs, watery diarrhea, and hemoconcentration. Exacerbations and remissions of these signs and symptoms have been demonstrated repeatedly with increased and restricted fluid intakes, respectively. Occasional instances occur in which small oral or intravenous intake, e. g., 200 to 500 cc., is followed by the onset of one or more of these signs and symptoms. Restriction of fluids in these patients leads to disappearance of the signs and symptoms. Pathologically, retroperitoneal edema has been the commonest type of edema, and the resulting symptoms have often resembled those of surgical conditions of the abdomen. Throughout the acute phase of illness, fluid should be administered on the basis of detailed intake and output records. In the case of rapid evacuation through several medical installations where intake and output records are not available, fluid intake should be restricted to 1,000 to 1,500 cc. and parenteral fluids should be avoided.

Certain adjuncts have been found to increase and support blood pressure and pulse pressure in the treatment of the shock of hemorrhagic fever: Trendelenburg position, elastic bandages around legs and thighs, vasoconstrictors (epinephrine or ephedrine), intravenous hypertonic glucose, whole blood, plasma, dextran, and concentrated human albumin. Concentrated human albumin has been the most effective. In mild cases, the use of any of these adjuncts plus rest in bed results in a maintained pressure without signs and symptoms of shock. As long as clinical shock is not evident and blood pressure is maintained (though only at such low levels as 80/68 or 92/80), vigorous measures to increase blood pressure should not be attempted. Such measures become decreasingly effective as they are repeated, and the overall clinical effect is small or negligible during protracted periods of hypotension. In fact, such overtreatment has been associated with a definite cycle in certain edematous patients: shock, vigorous treatment with intravenous fluids and vasoconstrictors, improvement in signs and symptoms of shock, transudation of circulatory fluid plus its oncotic chemicals into extravascular tissues, increasing edema, shock, decreased effectiveness of pressure-supporting measures, increasing edema, irreversible shock, and death. Vasoconstrictors administered intravenously will cause transient marked elevations in blood pressure, while more prolonged, less marked effects are obtained by the intramuscular use of these drugs. The present method of managing shock in hemorrhagic fever is based on the attempt to maintain a clinically adequate pulse pressure (though narrow) by conservative measures and by careful evaluation of the fluid balance and cardiovascular status of the patient.

The following example of the management of shock in hemorrhagic fever is based on the principles and observations that have been described. It is assumed that the patient is edematous and manifests signs and symptoms of shock with a blood pressure of 50/40. He is placed in the Trendelenburg position with elastic bandages wrapped tightly around his lower extremities, and blood pressure is recorded every five minutes. The blood pressure may be maintained or may increase to such levels as 70/50 with subsequent clinical improvement for one or more hours. In mild cases, the pressure may continue to rise and no further measures may be necessary. If the pressure drops, 15 mg. of ephedrine is given intramuscularly. This usually results in a slight increase in blood pressure and widening of the pulse pressure (74/58). A pulse pressure of 15 to 30 may be maintained for one to three hours, after which it may become necessary to repeat the administration of ephedrine. A decreased effect of shorter duration will be observed, and the dose of ephedrine can be increased. When ephedrine results in no significant clinical effect or when side-effects become evident, 100 to 200 cc. of concentrated human albumin is given. Ordinarily, this leads to improvement for three or more hours, and it may then be repeated.

Vasoconstrictors and concentrated human albumin can often be alternated with good results. The effectiveness of each agent will diminish as that agent is repeated; however, the cautious use of each to its maximal effectiveness will prolong the benefits and maintain clinically adequate blood pressures for 24 to 72 hours. At the end of that time, shock is frequently replaced by hypertension associated with oliguria and azotemia. Shock due to blood loss is treated by replacement transfusions. Dramatic results in the treatment of shock have not been obtained with dextran, adrenocorticotrophic hormone, or pressor principle of the posterior lobe of the pituitary.

HEMORRHAGIC MANIFESTATIONS

Hemorrhagic manifestations start about the third day of illness and are associated with decreased numbers of platelets, increased capillary fragility, prolonged bleeding time, and prolonged clot retraction. Petechiae, purpura, ecchymoses, and gross hemorrhage can occur in any tissue. Examples of sites in which bleeding has been observed include skin, mucous membranes, conjunctiva, retina, lung, endocardium, stomach, intestines, liver, spleen, kidney, renal pelvis, bladder, spinal fluid, spinal cord, and brain. The course of hemorrhagic fever commonly includes episodes of hemoptysis, epistaxis, hematemesis, melena, and hematuria. In the presence of the bleeding tendency, trauma is the most important precipitating factor of hemorrhage. Petechiae develop in pressure areas, e. g., axillary folds, belt line, flanks, buccal mucosa at the line of closure of the teeth, and palatal mucosa under dentures. Cerebellar signs and symptoms appeared in one patient after a severe bout of coughing, and, at postmortem examination, cerebellar hemorrhage was present. Conjunctival hemorrhages, retinal hemorrhages, and hematemesis have appeared following prolonged vomiting. A patient with conjunctival edema was seen to rub his "burning" eyes, and the result was subconjunctival hemorrhages. It is evident that the best management of hemorrhagic phenomena is prevention. Atraumatic evacuation (for example, by helicopter) to a nearby hospital should be accomplished, and the patient should be kept in bed at that hospital throughout his hemorrhagic course. Patients who are restless, combative, straining, coughing, retching, or vomiting should be sedated. The use of meperidine hydrochloride has been most satisfactory for this purpose; in fact, it has proved far superior to all other methods. These methods have reduced the incidence of severe hemorrhagic manifestations, while the use of vitamin C, vitamin K, and rutin has shown no significant results. Blood loss is treated with replacement transfusions.

On the third to sixth day of illness, renal involvement becomes apparent by the presence of albumin, erythrocytes, leukocytes, and casts in the urine. The kidneys show intense medullary congestion and tubular necrosis. Azotemia appears as urine output decreases, and urine specific gravity approaches 1.010 as renal concentrating and diluting functions are lost. Clinical signs and symptoms of renal involvement include edema, oliguria, costovertebral angle tenderness, hypertension, and uremic manifestations. Occasionally, hemorrhage into the kidney or renal pelvis causes renal colic. Typically, a rapid diuresis starts on the 9th to 11th day of illness and azotemia disappears. The urine becomes free of albumin and cellular elements, and kidney diluting function returns to normal in one to two weeks, while concentrating function returns to normal in three to five weeks.

RENAL DISEASE

The course of renal disease in hemorrhagic fever resembles that of lower nephron nephrosis, and treatment is based on fluid balance and electrolyte management. This necessitates the evaluation of daily weight, intake and output, blood nonprotein nitrogen and creatinine, and serum chloride, sodium, potassium, calcium, and carbon dioxide-combining power in relation to the physical status of the patient. During the oliguria, the non-protein nitrogen, creatinine, and potassium levels increase, while the ionized calcium and carbon dioxide-combining power decrease. Blood chloride levels decrease following vomiting. In the average patient, these electrolyte abnormalities cause mild or no clinical signs and symptoms and the only treatment required is rest in bed, sedation, and fluid management. A low salt, high carbohydrate (protein-sparing) liquid intake is recommended, based on the patient's total output plus the estimated insensible fluid loss. During the diuretic phase, electrolyte abnormalities rapidly adjust to normal.

Special management may be required for severe uremia and hyperkalemia of the oliguric phase and for excess fluid and electrolyte loss during diuresis. Intravenous calcium gluconate has been used therapeutically for neurological manifestations of uremia, including convulsions. At such times, oral or intramuscular calcium administration has been useful prophylactically. Clinical, electrocardiographic, and flame photometer evidence of hyperkalemia is observed during severe oliguria, especially in the presence of hemorrhage into tissue. Hyperkalemia can often be controlled by combined therapy of oral or rectal cation exchange resins with injections of calcium gluconate, insulin, and glucose. The artificial kidney and peritoneal lavage have been used in selected patients with progressive uremia and hyperkalemia. In the replacement of blood loss due to hemorrhage, fresh blood is preferable to stored blood because of the increased potassium content of the latter. Edema fluid is resorbed into the circulating volume during the diuretic phase, and spontaneous pulmonary edema may result due to an overloading of the unstable cardiovascular system. For this reason, intake should be oral, although cautious administration of intravenous fluids and electrolytes may be necessary in those instances where oral intake does not keep pace with the output. Occasionally, voluminous diuresis leads to salt and potassium loss, which must be replaced.

Diuresis is followed by the convalescent phase, which lasts three to five weeks. Blood chemistry determinations return to normal within the first week of this phase, but the white blood cell count and erythrocytic sedimentation rates remain elevated. Following mild renal involvement,

urinalyses and renal function tests rapidly become normal, at which time these patients can be returned to complete activity. Following moderate to severe renal involvement, concentrating function is the last abnormal finding. The following regimen is recommended for the progressive ambulation of convalescent hemorrhagic fever patients. When the urine specific gravity following a concentration test is 1.010 to 1.012, the patients are permitted to walk to the bathroom only. With values of 1.013 to 1.015 they walk about at will. Mild exercise is started when concentrating ability reaches 1.016 to 1.019, and this progresses to full exercise for values of 1.020 to 1.025. This procedure is based on renal function and may require modification in certain rare instances such as a patient with severe debilitation after a prolonged illness and a patient with residual paralysis following hemorrhage into the spinal cord. Ordinarily, weight and strength have returned to normal by the end of the convalescent phase.

SUMMARY

Hemorrhagic fever is a disease of unproved etiology, probably viral or rickettsial. Its chief manifestations are nonspecific febrile, cardiovascular, gastrointestinal, hemorrhagic, renal, and neurological. The acute febrile phase lasts three to six days and is treated with rest in bed, sedation, and fluid management based on detailed intake and output records.

Shock in hemorrhagic fever usually occurs between the third and sixth days of illness and is associated with involvement of the cardiovascular system by the disease. Severe shock has often been correlated with a prolonged acute phase, delayed initiation of medical care, traumatic or prolonged medical evacuation, and severe edema following excessive oral or parenteral intake. Since most of the deaths due to hemorrhagic fever have occurred during the acute shock phase, attention is directed to the following principles of management, which have resulted in the most successful treatment of the shock phase: prompt and atraumatic evacuation by litter; conservative fluid management based on detailed intake and output records; treatment of shock with Trendelenburg position; elastic bandages on lower extremities; vasoconstrictors; and concentrated human albumin, using each alone and to its maximal effectiveness on the basis of careful titration of blood pressure. This is not the final answer to the problems of shock in hemorrhagic fever, but it has been a successful regimen of management.

Hemorrhagic manifestations start about the third day of illness and last three to eight days. They are associated with decreased numbers of platelets, increased capillary fragility, prolonged bleeding time, and prolonged clot retraction. Bleeding can occur in any tissue in the body, and with significant blood loss the treatment is replacement transfusions. In the presence of a bleeding tendency, hemorrhage is usually precipitated by trauma. Careful handling, atraumatic evacuation, and sedation will prevent severe hemorrhagic manifestations.

Renal disease in hemorrhagic fever starts on the third to sixth day of illness and resembles lower nephron nephrosis with tubular necrosis, albuminuria, oliguria, edema, azotemia, loss of renal function, hypertension, uremic manifestations, and hyperkalemia. The stage of disease and treatment required are indicated by daily physical examinations, weights, intake and output records, urinalysis, and blood chemistry determinations. Diuresis starts on the 9th to the 11th day of illness. Routine treatment includes rest in bed, sedation, and a low salt, high carbohydrate (protein-sparing) liquid intake. The amount of intake is based on the total output plus the insensible fluid loss. Calcium gluconate is used therapeutically and prophylactically for uremic neurological manifestations. Calcium gluconate, insulin, and glucose injections in conjunction with oral or rectal cation exchange resins often control hyperkalemia. The artificial kidney and peritoneal lavage have been used somewhat successfully in selected patients with progressive uremia and hyperkalemia. Pulmonary edema, loss of salt, and loss of potassium may occur during diuresis.

The convalescent phase lasts three to five weeks after diuresis. The last abnormal findings to return to normal are the white blood cell count, the erythrocytic sedimentation rate, and kidney concentrating function. Since abnormal kidney function is the usual problem of convalescence, progressive ambulation is based on the improved concentrating ability of the kidney. Weight and strength are normal by the end of the convalescent phase. Sequelae following hemorrhagic fever are extremely rare, and on the basis of present information there is no known pattern of residuals. One patient is known to have residual paralysis in the left foot following hemorrhage into the spinal cord.

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Bulbar Paralysis.—The patient with true bulbar paralysis has symptoms related to the ninth, tenth and eleventh cranial nerves, although sometimes the facial nerve is involved as well. Involvement of these cranial nerves is indicated by paralysis of the palate, the pharyngeal muscles and the laryngeal muscles, with resultant difficulty in swallowing, a weak ineffective cough and the pooling of secretion in the respiratory tract. Respiratory obstruction soon becomes evident. Occasionally also the respiratory and cardiovascular centers in the medulla become affected. The treatment is directed towards the relief of the respiratory obstruction, and consists of the following measures: (1) suction of the pharynx, (2) postural drainage, (3) oxygen therapy, (4) tracheotomy, (5) intragastric feeding.

If signs of medullary respiratory failure develop, or if the bulbar signs are associated with high spinal paralysis involving the intercostal muscles and the diaphragm, the patient has also to be placed in a respirator. When a patient has pharyngeal paralysis with pooling of mucus, it is advisable to perform a tracheotomy before using the respirator.

Respiratory paralysis due to involvement of the intercostal muscles and the diaphragm occurs in the spinal type of poliomyelitis, and is usually associated with extensive paralysis of limbs and trunk. This type of case nowadays mostly occurs in young adults, particularly in the twenty to twenty-four year age group, and it is responsible for this group having the highest mortality figures. . . . —H. McLorinan, M.D., The Management of the Acute Phase of Poliomyelitis, *Medical Journal of Australia*, July 5, 1952.

LABORATORY DIAGNOSIS OF LIVER DISEASE

COORDINATED USE OF HISTOLOGICAL AND BIOCHEMICAL OBSERVATIONS

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The differential diagnosis of liver diseases or jaundice is almost as thorny a problem today as it was before the development of modern tests for determination of hepatic function. This differential diagnosis is still made more easily on the basis of clinical observations than on the basis of laboratory studies. The inadequacy of laboratory procedures does not result from ignorance of hepatic physiology, the understanding of which has rapidly expanded within the last decade. This shortcoming is chiefly due to two factors: 1. Almost none of the so-called liver function tests available measure a basic function of the liver, in contrast, for example, to tests of renal function. 2. Most hepatic diseases are composed of several basic pathological processes, each of which influences the results of the hepatic tests in a different way. In an attempt to overcome these difficulties it appears justified to describe the different processes and their influence on the hepatic tests. This may serve as a basis for a rational but simple application of the tests in the individual diseases. For the purpose of making such a study, a relatively small number of the available tests were selected for discussion, the basis of selection being primarily their technical simplicity.

In recent years liver biopsy, especially by needle, has been utilized with increasing frequency. In addition to its diagnostic contribution in the individual patient, it has provided an opportunity to correlate functional and structural alterations,[1] which was not possible with necropsy material.[2] In most cases, either the biopsy or the hepatic tests suffice for the recognition of the basic alterations. Since the biochemical methods entail less discomfort for the patient and may be more easily available, they deserve preference, with the use of biopsy restricted to specific problems. The relation of the various tests to histological features and the factors responsible for abnormal results are described in table 1.

BASIC PATHOLOGICAL PROCESSES

Liver Cell Degeneration.—Histologically, variations in the size of adjacent liver cells as well as in the staining qualities of their nuclei and cytoplasm indicate liver cell degeneration.[10] This may progress to complete necrosis and disappearance of the cells, followed by accumulation of scavenger cells (segmented leukocytes or mononuclear cells) either focally or diffusely (fig. 1). Liver cell degeneration found in almost every lobule of the liver is the histological feature best correlated with functional hepatic damage.[11] Individual etiological factors cause characteristic variations in liver cell degeneration. These factors may be viruses (infectious hepatitis, homologous serum jaundice, infectious mononucleosis, yellow fever); chemical, bacterial, and endogenous toxins; dietary deficiencies (chronic protein or vitamin lack); relative deficiencies (due to amino acid antagonists[12] or depleters[13]); anoxia (due to shock); congestion (due to heart failure); capillary damage (eclampsia); and prolonged biliary obstruction.

Diffuse liver cell degeneration, in general, is reflected in abnormal cephalin flocculation, increased thymol turbidity, and a low cholesterol ester ratio. In addition, the urinary urobilinogen level is elevated, there is sulfobromophthalein (bromsulphalein®) sodium retention, and the serum albumin level, the serum albumin-globulin ratio, the serum cholinesterase level, hippuric acid synthesis, and galactose tolerance are decreased.[14] Varying degrees of bilirubinuria may be present. Protracted severe liver cell damage results in a lowering of the prothrombin time that responds poorly to vitamin K therapy. In view of the large number of readily available functional procedures, liver biopsy is, as a rule, unnecessary for determination of the extent of hepatocellular damage.

Cholestasis.—Jaundice may be associated with interference with bile flow (fig. 2). Jaundice without impairment of bile flow may result from over-production of bilirubin (hemolytic jaundice) or of retention of bilirubin due to an elevated excretion threshold (familial nonhemolytic jaundice). It is readily recognized by the absence of bilirubinuria, by a negative direct van den Bergh reaction of serum bilirubin, and by hematological tests.

Interference with bile flow is the commoner cause of jaundice after the neonatal period. It may occur at the source of bile, because of liver cell degeneration, or along the course of the bile flow, owing to mechanical or functional interference within the bile capillaries or bile ducts. Interference with the flow of bile after its formation is termed cholestasis. In cholestasis, bile pigment is seen in the Kupffer cells, and dilated bile capillaries contain inspissated bile and bile plugs, appearing initially in the center of the lobule. Subsequently, as an expression of liver cell degeneration concomitant with cholestasis, granular bile pigment is found in the liver cells. Prolonged cholestasis is associated with fibrosis of the portal triads, with little cellular inflammation if no complicating infection is present (fig. 3). Finally, extravasation of bile may occur in the lobular parenchyma or in the portal triads, causing necrosis of the surrounding cells.[15]

Regurgitation of bile from the bile capillaries into the blood stream results in an increase in the blood bilirubin

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level and bilirubinuria. In addition, the serum alkaline phosphatase and the total cholesterol levels are elevated. Elevation of these levels does not occur solely because of regurgitation, as originally thought, but is also due to stimulation of their formation by the liver under the influence of cholestasis.[16] There is some inhibition of turbidity in the flocculation tests, especially in the zinc sulfate turbidity test, caused by regurgitated biliary substances.[17] This phenomenon may mask the presence of associated liver cell degeneration.

Cholestasis may be caused by extrahepatic or intrahepatic factors; however, laboratory tests do not differentiate between the two. Extrahepatic factors include obstruction of the common or hepatic bile ducts by tumors, stones, or strictures. The intrahepatic form (primary cholestasis) may be due either to rare mechanical factors (congenital atresia [18] or inflammatory obliteration of the intrahepatic ducts [19]) or to functional factors.[20] The functional factors act either on the smallest bile ducts in the portal triads or on the cholangioles in the lobular parenchyma. The differentiation of jaundice that is due to cholestasis from jaundice due to liver cell degeneration by means of laboratory tests does not coincide with the "therapeutic" separation of surgical jaundice (tumors, stones, or strictures) from medical jaundice (hepatitis or cirrhosis) (fig. 2). Intrahepatic cholestasis is treated medically, but it gives the same laboratory results as jaundice that must be treated surgically and is, therefore, a major diagnostic problem. As a rule, intrahepatic cholestasis ("cholangiolitis"[20a]) is a complication of viral or toxic (arsenical [20b]) hepatitis or of cirrhosis with liver cell degeneration. In the relatively few cases of intrahepatic cholestasis without liver cell degeneration, liver biopsy may be the only way to differentiate it from jaundice requiring surgery and then only after prolonged disease. Dilatation of the bile ducts with extravasation of bile in the portal triads and rarefication of the liver cell cytoplasm with necrosis in circumscribed foci in the lobular periphery (bile infarcts) indicate extrahepatic obstruction, though their absence does not exclude such a condition.

Inflammation.—Intralobular inflammation in liver disease usually accompanies liver cell degeneration. It either is caused by the agent responsible for the original hepatic injury (viruses, toxins, or retained biliary substances) or is elicited by the breakdown of liver cells. Morphologically, proliferation of the lining endothelium of the sinusoids (the Kupffer cells) as well as infiltration by histiocytes, lymphocytes, and occasionally plasma cells and segmented leukocytes may occur in the lobular parenchyma (usually around necrotic cells) or in the portal triads (fig. 4). The proliferation of the Kupffer cells and/or the presence of round cells in the portal triads is associated with increased gamma globulin in the serum, probably formed by these cells.[17] Increased gamma globulin is shown by electrophoresis or turbidimetric methods.[21] Inflammation indicated by an elevated gamma globulin level may be present in all types of hepatic injury, being most apparent in cirrhosis. In obstructive jaundice, gamma globulin formation may not be increased, probably because of inability of the proliferated, bile laden Kupffer cells to produce it.[17]

Fatty Metamorphosis.—Fat can be seen in liver cells in varying quantities, from fine droplets to large globules that replace almost the entire cytoplasm of the cells (fig. 5). Fatty metamorphosis may involve only a few cells within the lobule or, in the full-blown "fatty liver," nearly every liver cell; in fact the large fat laden cells may coalesce to form a fat cyst.[22] Fatty livers are caused by deficiencies or toxic substances, the classic example

TABLE 1.—*Liver Function Tests Discussed,* with Levels of Abnormal Results, Biochemical Causes of Abnormality, and Structural Alterations Indicated by Abnormal Results*

Test and Abnormal Level	Author	Cause of Abnormality	Structural Alteration Primarily Indicated
Cephalin flocculation: higher than 2 plus	Hanger [3]	Depression of stabilizing albumin and alpha globulin, with elevation of precipitating gamma globulins	Liver cell degeneration
Thymol turbidity: higher than 5 units †	Maclagan [4]	Depression of stabilizing albumin and elevation of precipitating gamma globulins and lipoproteins (and lipids)	Liver cell degeneration
Zinc sulfate turbidity: higher than 12.5 units † and less than 6 units †	Kunkel [5]	Elevation of precipitating gamma globulins and some depression of albumin	Inflammation; cirrhosis
		Regurgitation of unknown depression factor	Cholestasis
Serum gamma globulin: higher than 1.50 gm. per 100 ml.‡	de la Huerga and Popper [6]	Elevation of precipitating gamma globulins	Inflammation; cirrhosis
Serum cholesterol: higher than 300 mg. per 100 ml.	Bloor and Knudson [7]	Decreased biliary excretion or stimulated production	Cholestasis
Serum cholesterol ester ratio: less than 50%	Schoenheimer and Sperry [8]	Inability of damaged liver to esterify cholesterol	Liver cell degeneration
Serum alkaline phosphatase: higher than 15 Bodansky units §	Bodansky [9]	Faulty excretion of osteogenic, intestinal, or hepatic phosphatase or increased formation in the liver	Cholestasis

* Sulfobromophthalein sodium retention, an accurate measure of hepatic function, was not utilized in this study, because most of the patients were jaundiced. In view of the emphasis given here to serum studies, urinary bilirubin and urobilinogen were not considered, despite their important role in the differential diagnosis of jaundice.

† Normal values vary according to the standards used.

‡ Elevation above 1.25 gm. per 100 ml. is abnormal. For differential diagnosis in liver disease, a higher borderline is preferable.

§ In adults, elevation above 4 Bodansky units is abnormal. For the demonstration of cholestasis, a higher borderline is preferable.

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of the former being the choline deficient fatty liver [23]; however, protein deficiencies, especially imbalance in the availability of protein in relation to carbohydrates and fats as well as to certain vitamins are of greater importance in man, e. g., in the alcoholic fatty liver. Severe fatty metamorphosis is associated with surprisingly little evidence of functional impairment of the liver cells, although the normal cytoplasm appears to be almost completely missing. Slight increase in the serum bilirubin level and sulfobromophthalein sodium retention may be the only functional manifestations.[24] They are more indicative of interference with hepatic blood flow than of insufficiency of the hepatic parenchyma. The results of other hepatic tests are abnormal if fatty metamorphosis is complicated by other hepatocellular changes, especially necrosis. Therefore, for recognition of the fatty liver, liver biopsy is superior to biochemical methods. In the long run, fatty metamorphosis increases the susceptibility of the liver to injury, with resulting acute degenerative changes, or it leads to fibrosis owing to (*a*) impaired circulation in the sinusoids caused by compression by the fat laden cells [25]; (*b*) collapse of fat cysts,[22] or (*c*) dissection of the lobule by connective tissue originating from the portal triads. Whatever the mechanism, cirrhosis formation is the end result.

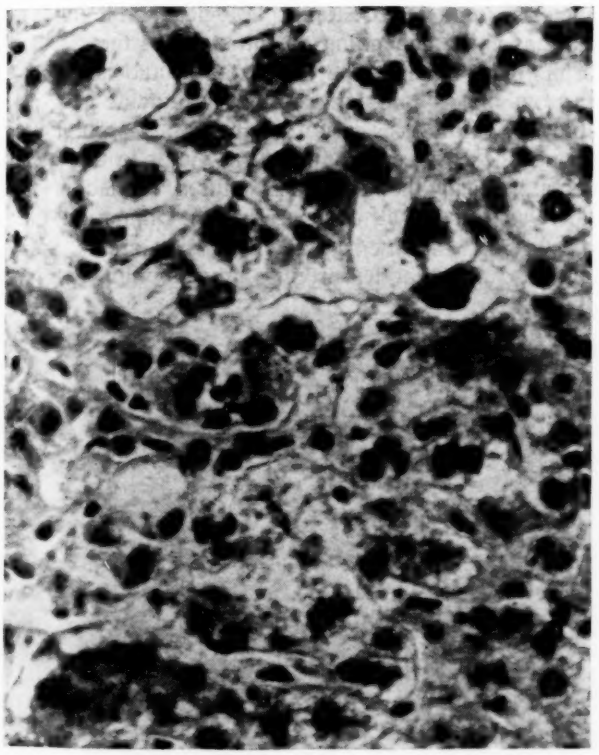

Fig. 1.—Liver cell degeneration, in acute viral hepatitis (H and E stain, × 306); the liver cells and their nuclei vary in size and staining quality, and many balloon cells are seen. The cytoplasm is often clumped. Associated biochemical alterations are abnormal cephalin flocculation and thymol turbidity and decreased serum cholesterol ester ratio.

Cirrhosis Formation.—When sheets of fibrous tissue or septums subdivide the lobule, nodules are formed (fig. 6). The separate nodules, growing by regeneration, may compress the branches of the hepatic vein, leading to portal hypertension.[26] Vessels contained in the septums produce abnormal communications between the branches of the portal and hepatic veins. Blood thus bypasses the lobular parenchyma, resulting in unfavorable circulatory conditions in it.[27] These "internal Eck fistulae" do not relieve portal hypertension because of the compression of the hepatic veins that are situated heartward to them.[27b] Septums arise from the periphery of the lobule after inflammation or fatty metamorphosis or from the center

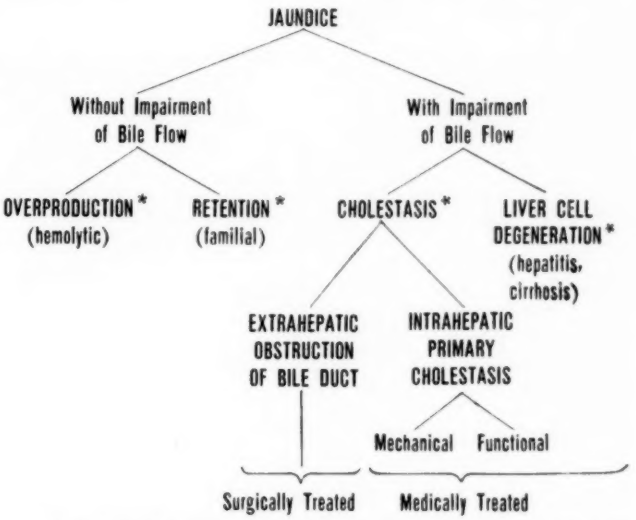

Fig. 2.—Types of jaundice; the divisions marked by asterisks are those entities that can be differentiated by laboratory tests.

of the lobule primarily as the result of chronic congestion.[28] Localized formation of septums occurs after necrosis of whole lobules with collapse and distortion of the surrounding parenchyma. Intralobular connective tissue proliferation may occur in strands along cholangioles. This interstitial fibrosis, as, for example, in chronic biliary obstruction, does not impair hepatic blood flow or result in portal hypertension until late in the disease.

The degree and rate of cirrhosis formation are reflected in tests measuring either hepatic circulation (sulfobromophthalein sodium retention) or hepatocellular degeneration. If even far advanced cirrhosis is not actively progressing at the time of examination, tests indicating liver cell degeneration may show normal results. Since Kupffer cell mobilization and reticuloendothelial cell infiltration in the septums take place in most forms of cirrhosis, elevation of the serum gamma globulin level, even in the presence of normal flocculation tests, is a suggestive but not a specific sign of cirrhosis. In view

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of the failure of hepatic tests to give specific indications of cirrhosis, liver biopsy appears to be the most reliable procedure for its diagnosis.[29]

DIAGNOSTIC APPLICATIONS

A summary of the results of liver function tests and biopsies in series of ward patients with hepatitis, cirrhosis, and biliary obstruction from Cook County Hospital is given in table 2. (These cases were studied with Dr. Frederick Steigmann and Dr. J. de la Huerga.)

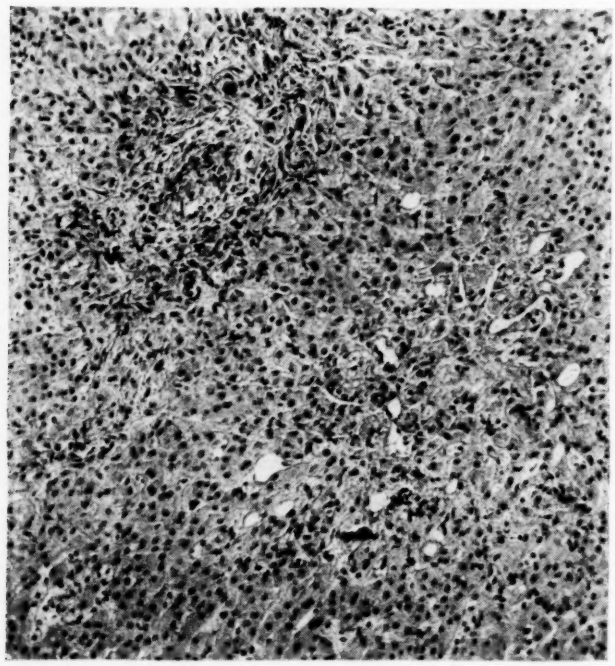

Fig. 3.—Cholestasis in carcinoma of the head of the pancreas (H and E stain, × 102); the liver cells in the center of the lobule reveal granular bile pigment and surround dark bile plugs; the portal triad is enlarged because of fibrosis and contains inspissated bile in the form of microcalculi. Associated biochemical alterations are increased serum alkaline phosphatase and total cholesterol levels and decreased zinc sulfate turbidity.

Viral Hepatitis.—In the common varieties of viral hepatitis, previously called catarrhal jaundice, liver cell degeneration is the most conspicuous change demonstrable morphologically as well as functionally. Functionally, it is reflected in abnormal cephalin flocculation, increased thymol turbidity, and a lowered cholesterol ester ratio (table 2). In addition, inflammation in varying degrees often occurs, primarily in the form of Kupffer cell reaction and infiltration by histiocytes.[30] This is reflected in an elevated serum gamma globulin level and elevated zinc sulfate turbidity. The signs of cholestasis may be present, and occasionally the serum cholesterol level is elevated and the alkaline phosphatase level is above 15 Bodansky units. In the exceptional case, the inflammatory or cholestatic features predominate to the extent that either inflammation or cholestasis appears to be the sole abnormality. In delayed recovery such dissociation is especially common. Persistent liver cell degeneration is unusual. Persistent inflammation with increased serum gamma globulin is much commoner and may end in cirrhosis. In contrast, persistent cholestasis in the form of cholangiolitic hepatitis or cirrhosis is much less common but is a recognized clinical entity.[20a]

Toxic Hepatitis.—Toxic hepatitis includes the etiologically well-defined chemical hepatitis and forms of hepatic injury in which the injurious substance is ill-defined or even unknown. Morphologically, it differs from viral hepatitis in the acute stage in that the inflammatory component is usually less prominent and the degeneration more uniform in a given zone. Fat accumulation may occur. Results of laboratory tests in the cases studied differ from those in viral hepatitis only in that the flocculation tests are normal in a significant number of instances (cephalin flocculation in 23.5% of cases, thymol turbidity in 44.1%, and zinc sulfate turbidity in 58%).

Cirrhosis.—Several forms of cirrhosis are recognized. The common variety results oftener from nutritional deficiencies, as occurs in alcoholics, than from chronic hepatitis (the relative incidence depending on the type of material studied). Great morphological and functional variations exist, depending on the stage of the disease. Morphologically, liver cell degeneration and inflammation are about as common as they are in acute hepatitis (table 2). Cholestasis is not so frequently seen. Fatty metamorphosis is very common but yields to treatment much more easily than the other features.[31] In laboratory studies, also, liver cell degeneration, inflammation, and cholestasis are detected as often as they are in acute hepatitis, except that the serum gamma globulin level and zinc sulfate turbidity in patients with cirrhosis are abnormal oftener and to a greater degree; nevertheless, differentiation of cirrhosis from acute hepatitis by laboratory methods will be possible only by liver biopsy, the only procedure useful in recognition of the inactive stage.[29]

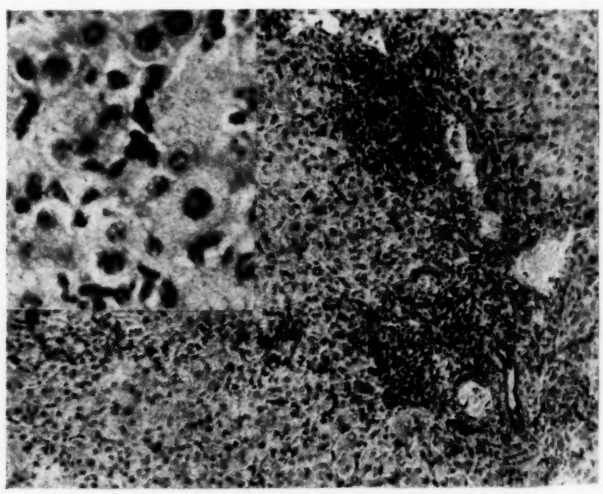

Fig. 4.—Inflammation, in chronic viral hepatitis (H and E stain, × 72; insertion, × 237); histiocytes, lymphocytes, and some plasma cells accumulate in the enlarged portal triads; the Kupffer cells are proliferated, and histiocytes are seen in and around the sinusoids. Associated biochemical alterations are increased serum gamma globulin level and zinc sulfate turbidity.

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22. Hartroft, W. S.: Accumulation of Fat in Liver Cells and in Lipodiastaemata Preceding Experimental Dietary Cirrhosis, Anat. Rec. **106**: 61-87 (Jan.) 1950.

Extrahepatic Biliary Obstruction.—The functional and morphological manifestations of cholestasis are in the foreground in this condition. Some liver cell degeneration occurs relatively early and is only occasionally missed in the biopsy specimen. Inflammation is usually more apparent histologically than chemically. The alkaline phosphatase level is considerably elevated [32] and the total cholesterol level is usually high (table 2). The serum albumin level and cholesterol ester ratio [33] are low, as a result of liver cell degeneration. The flocculation tests are normal in the majority of cases, since, even if inflammation is present, the hepatic gamma globulin formation is suppressed by the bile imbibition of the Kupffer cells. The influence of the regurgitated depression factor is especially noted in the zinc sulfate turbidity, which is below 6 units in almost one-fourth of the cases in table 2; this is true in acute hepatitis in only 3.5% and in cirrhosis in only 0.4% of the cases. Therefore a low zinc sulfate turbidity in the presence of jaundice is a valuable laboratory indication of obstructive jaundice requiring surgical treatment, provided that the rare cholangiolitic hepatitis can be excluded.

TABLE 2.—*Percentage Occurrence of Functional and Structural Abnormalities in Series of Cases of Hepatitis, Cirrhosis, and Biliary Obstruction*

Structural Abnormalities	Acute Hepatitis 65 Biopsies, %	Cirrhosis 78 Biopsies, %	Extrahepatic Obstruction 18 Biopsies, %
Liver cell degeneration	97.1	95.0	55.6
Inflammation	67.6	61.5	38.9
Cholestasis	29.2	11.5	100
Fatty metamorphosis	1.5	28.2 *	0
Cirrhosis formation	0	100	0
Functional Abnormalities	**122 Determinations, %**	**249 Determinations, %**	**72 Determinations, %**
Cephalin flocculation: higher than 2 plus	82.6	74.1	31.9
Thymol turbidity: higher than 5 units	75.5	69.4	26.4
Zinc sulfate turbidity: higher than 12.5 units	73.6	83.0	27.8
lower than 6 units	3.5	0.4	22.2
Serum gamma globulin: higher than 1.50 gm. per 100 ml.	57.8	83.5	32.5
Serum cholesterol: higher than 300 mg. per 100 ml.	17.0	6.2	38.2
Serum cholesterol esters: less than 50%	52.0	30.8	58.8
Serum alkaline phosphatase: higher than 15 Bodansky units	5.7	6.4	57.0

* This does not reflect the actual occurrence of fatty liver in cirrhosis because many of these patients had been under treatment at the time of liver biopsy. This is not true of the chemical determinations, which were done shortly after admission.

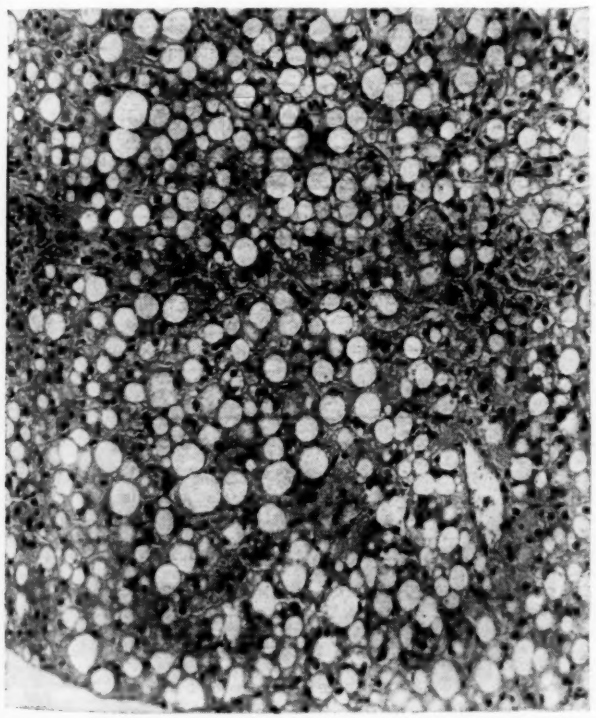

Fig. 5.—Fatty metamorphosis, in chronic alcoholism (H and E stain, × 132); the cytoplasm of most of the liver cells contains large or small fat droplets displacing the nucleus; the lobular architecture is not distorted. The only necessarily associated biochemical alteration is sulfobromophthalein sodium retention.

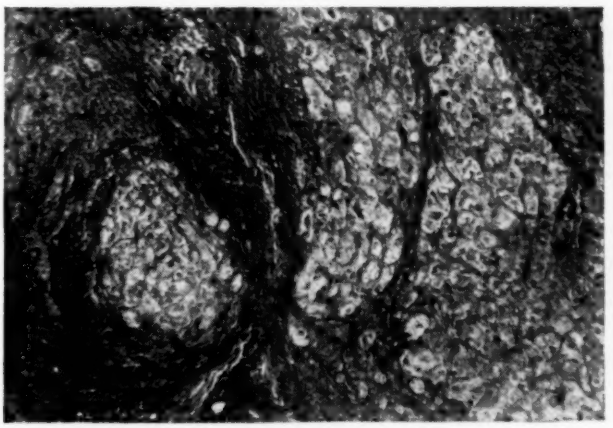

Fig. 6.—Cirrhosis formation, in alcoholic dietary cirrhosis (Mallory stain, × 63); nodules of various sizes are produced by dissection of the lobular parenchyma by dense connective tissue septums. Usually associated biochemical alterations are elevation of the serum gamma globulin level and zinc sulfate turbidity and sulfobromophthalein sodium retention. Results of other hepatic tests depend on associated liver cell degeneration or cholestasis.

Differentiation Between Jaundice Requiring Surgical Treatment and That Requiring Medical Treatment.—In jaundice requiring medical treatment (that caused by hepatitis and cirrhosis), as a rule, liver cell degeneration exceeds cholestasis, while in jaundice requiring surgical treatment (that caused by tumors, stones, and strictures) the reverse is true. The results of the flocculation tests and the alkaline phosphatase determination are probably the most helpful in differentiating between them. The

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former are abnormal in medically treated jaundice; the latter is very high in surgically treated jaundice; however, there are two main exceptions to this simple rule [31]: 1. Intrahepatic cholestasis cannot be differentiated from extrahepatic cholestasis by laboratory tests, since liver biopsy demonstrates extrahepatic obstruction only in protracted cases. 2. If severe inflammation due to bacterial infection complicates extrahepatic biliary obstruction, the laboratory picture becomes indistinguishable from that of medically treated jaundice, since the resulting elevation in the serum gamma globulin level may produce abnormal results in the flocculation tests. In this latter case, the clinical features of chills and fever with leukocytosis or possibly liver biopsy may clarify the problem.

SUMMARY

In order to facilitate the application of hepatic tests and liver biopsy in diagnosis, a series of individual features selected from the complex morphological picture of human liver disease are discussed. These are liver cell degeneration, cholestasis (with definition of the various types of jaundice), inflammation, fatty metamorphosis, and cirrhosis formation. Their histological features, etiology, functional significance, and recognition by laboratory tests are described, and the correlation between structural and functional alterations is emphasized. The understanding of the basic means of recognizing these features by laboratory tests and, where necessary, by liver biopsy assists in the diagnosis of hepatic diseases as well as in the differential diagnosis of jaundice.

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TREATMENT OF CHRONIC LEUKEMIAS

RESULTS OF THERAPY BY TITRATED, REGULARLY SPACED TOTAL BODY RADIOACTIVE PHOSPHORUS, OR ROENTGEN IRRADIATION

Edwin E. Osgood, M.D.
and
Arthur J. Seaman, M.D., Portland, Ore.

In a previous paper [1] evidence was presented that patients with chronic leukemias treated by a comprehensive program termed titrated, regularly spaced total body irradiation were able to spend over 80% of their leukemic life spans at their normal occupations and recreations. The number of patients involved, the period of observation, and the methods of analysis used did not permit a statement at that time that life was prolonged by this method of treatment. In the present paper a much larger series of patients is reported over a longer period of time, and the data have been analyzed by Tivey,[2] using a modification of the "maximum likelihood method" of Fisher,[3] Boag,[4] and Lea.[5] Evidence is presented in this paper that survival time is significantly prolonged by this program of therapy.

METHOD OF THERAPY

The method of therapy was described in a previous paper [1] and is summarized and contrasted with typical current practice in table 1. The results of excellent standard therapy for more than seven years in a case of chronic granulocytic leukemia (fig. 1*A*) are contrasted with results in the subsequent seven years of treatment in the same case with titrated, regularly spaced total body irradiation (fig. 1*B*). Spray roentgen irradiation was used in every case prior to Feb. 1, 1947, and has been continued in most, although in some radioactive phosphorus has been substituted. Most patients since that date have been treated with radioactive phosphorous. No attempt is made to compare these agents in this article.

COMPLICATIONS AND ASSOCIATED DISEASES

In tables 2 and 3 are listed the major complications and associated diseases encountered in caring for the patients of this series, together with an indication of their therapy. Certain of these deserve individual comment. The myelophthisic normocytic anemia [8] of both granulocytic and lymphocytic leukemia improved under therapy. We have listed these as myelophthisic, although work reported by Berlin [9] and by Ross and associates [10] would indicate that many such anemias may have represented latent hemolytic states. The anemia of granulocytic

From the Division of Experimental Medicine, University of Oregon Medical School.

Read before the Section on Internal Medicine at the 101st Annual Session of the American Medical Association, Chicago, June 11, 1952.

A folder on the scientific exhibit presented at the Annual Session of the American Medical Association, containing additional illustrations not included in this article, will be sent to those who specifically request a copy.

The radioactive phosphorus used in this investigation was supplied by Clinton Laboratories, Knoxville, Tenn., and by Carbide and Carbon Chemicals Division, Union Carbide and Carbon Corporation, Oak Ridge, Tenn., on authorization from the Isotopes Division, U. S. Atomic Energy Commission.

This work was supported in part by grants from the Medical Research Foundation of Oregon, the Division of Biology and Medicine of the U. S. Atomic Energy Commission, the Damon Runyon Memorial Fund, the American Cancer Society on recommendation of the Committee on Growth of the National Research Council, Mr. John C. Higgins, National Cancer Institute of the National Institutes of Health of the Federal Security Agency of the U. S. Public Health Service, and by private donors to the Leukemia Research Fund of the University of Oregon Medical School.

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leukemia almost uniformly improved when the leukemic process was under control. In chronic lymphocytic leukemia complicated by typical, severe, acquired hemolytic anemia, however, the excellent response to irradiation as manifested by decreased liver, spleen, and lymph node size and by lowered leukocyte count was unaccompanied by amelioration of the hemolytic anemia. It is in this group that corticotropin (ACTH) and cortisone therapy proved valuable in controlling the anemia. In selected cases, splenectomy proved of worth-while but temporary benefit.

The greater incidence of chronic bronchitis and bronchiectasis in patients with chronic lymphocytic leukemia was felt to be correlated with both the older mean age and the greater degree of hilar lymphadenopathy in this group. The possibility of irreversible damage by infiltration and lymphadenopathy has seemed to us an additional reason for the initiation of therapy as soon as the diagnosis of leukemia is established. Initial vigorous antibiotic therapy with procaine penicillin and streptomycin followed by prophylactic sulfonamide therapy with 1.0 gm. daily for life have been valuable in controlling the chronic bronchitis and bronchiectasis and probably in preventing a higher incidence of bronchopneumonia.

Weakness and hypermetabolism were combated by multiple feedings and a graduated exercise program. As soon as they were able, patients were instructed to walk as far as they easily could at least three times a day and to double this distance daily until they were walking 100 yards (91.4 m.) three times a day, then to increase by 100 yards daily until they were walking one mile (1.6 km.) three times daily. When this goal was attained, they could return to their usual full activities.

diets customarily used in treatment of hepatitis are ideal for these patients if all citrus fruit juices and cellulose-containing foods, except tomato juice and soft cooked carrots, are withheld. On this regimen the patient's weight usually returns to normal, and gradually thereafter it has

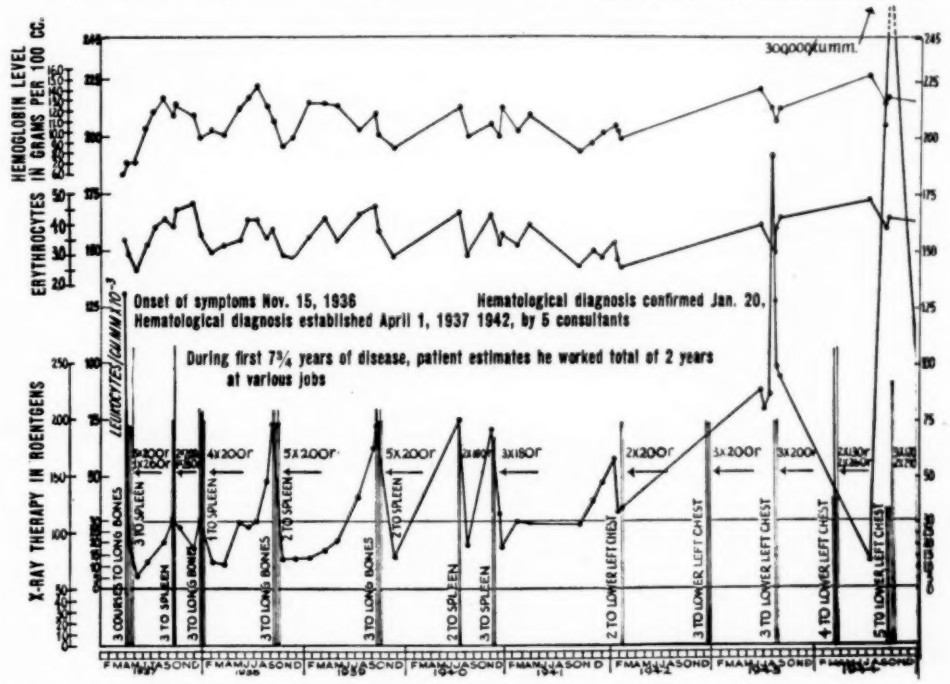
HEMOGLOBIN LEVEL IN GRAMS PER 100 CC.
ERYTHROCYTES IN MILLIONS PER CMM.
LEUKOCYTES/CMM X 10⁻³
X-RAY THERAPY IN ROENTGENS
300,000/cumm.
Onset of symptoms Nov. 15, 1936
Hematological diagnosis established April 1, 1937
Hematological diagnosis confirmed Jan. 20, 1942, by 5 consultants
During first 7¾ years of disease, patient estimates he worked total of 2 years at various jobs
3 COURSES TO LONG BONES
3 TO SPLEEN
3 TO LONG BONES
4X200r
5X200r
2 TO SPLEEN
3X180r
2X200r
3 TO LOWER LEFT CHEST
4 TO LOWER LEFT CHEST
5 TO LOWER LEFT CHEST

Fig. 1A.—Excellent standard (local x-ray) treatment, 1937-1944, for white man with chronic granulocytic leukemia. Contrast method of therapy and hematological response with that shown in figure 1B.

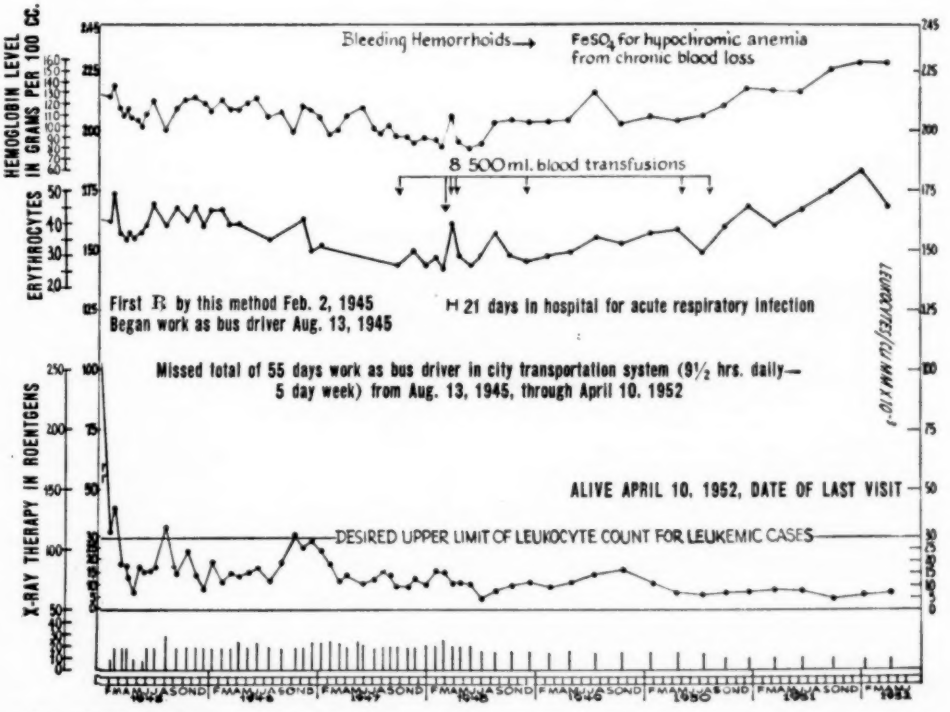
HEMOGLOBIN LEVEL IN GRAMS PER 100 CC.
ERYTHROCYTES IN MILLIONS PER CMM.
X-RAY THERAPY IN ROENTGENS
Bleeding Hemorrhoids→
FeSO₄ for hypochromic anemia from chronic blood loss
8 500 ml. blood transfusions
First R by this method Feb. 2, 1945
Began work as bus driver Aug. 13, 1945
H 21 days in hospital for acute respiratory infection
Missed total of 55 days work as bus driver in city transportation system (9½ hrs. daily—5 day week) from Aug. 13, 1945, through April 10, 1952
ALIVE APRIL 10, 1952, DATE OF LAST VISIT
DESIRED UPPER LIMIT OF LEUKOCYTE COUNT FOR LEUKEMIC CASES

Fig. 1B.—Same patient as shown in figure 1A, under titrated, regularly spaced total body roentgen ray therapy, for the immediately following seven years.

The small stomach syndrome produced by the intermediate position of that organ between the enlarged liver and spleen has been combated over the first month or two of therapy by a diet high in calories and protein but low in cellulose, in six approximately equal meals daily. The

been possible for the patient to resume a normal diet. Subacute bacterial endocarditis occurred in four patients. In one patient who died of endocarditis, the underlying valvular deformity was proved to be due to leukemic infiltration.

Forty-three of the 61 patients with chronic granulocytic leukemia and 47 of the 102 patients with chronic lymphocytic leukemia have died to the date of this writing. The direct causes of death are given in table 4. unrelated to the leukemia. Only 7 of the patients with chronic lymphocytic leukemia died in an acute terminal phase, although 18 other deaths in this group were probably related to the leukemia. In 22 of the patients with

TABLE 1.—*Contrasted Methods of Therapy for Patients with Leukemia*

Typical Current Practice	Titrated, Regularly Spaced P^{32} or Roentgen Ray Therapy [1]
Initial Therapy	
1. Treated when symptoms develop	1. Treated as soon as diagnosed
2. Disease or treatment not always explained to patient	2. Disease and treatment explained at first interview to allay fear
3. Dosage guided by average past experience	3. Dosage titrated by individual response of patient
4. Often treated locally	4. Entire body always treated
5. Initial dosage daily or every other day	5. Dosage once a week initially, which allows time to see effect of previous dose. Increase interval one week at a time until ideal maintenance dose and interval are found for that patient
Maintenance Therapy	
6. Dosage: 50 to 250 r of x-ray therapy daily; radioactive phosphorus; urethane, 1.0 gm. three times daily; or nitrogen mustard, 0.4 mg. per kilogram of body weight in divided doses	6. Dosage: 10 to 25 r of spray roentgen irradiation or 0.5 to 2.5 mc. of P^{32} given intravenously leads to no radiation sickness, nausea, vomiting, drowsiness, or apathy
7. Interval between treatments too short for most efficient clinical evaluation of dose and time of next treatment	7. Clinician interviews and examines patient before each treatment. Dose and time of next treatment decided in collaboration with radiologist or biophysicist
8. Leukocyte level is chief guide to therapy. Aleukemic and subleukemic leukemias often not treated	8. Direction of change in leukocyte count, spleen, lymph nodes, liver, hemoglobin level, and feeling of well-being are all used as guides. Aleukemic and subleukemic leukemias all treated
9. Aggressive treatment of associated diseases sometimes felt unwarranted because of the underlying leukemia	9. Treated for all associated diseases and complications [6]
10. Treated at irregular intervals and only when symptoms recur	10. Treated at regular intervals before symptoms recur
11. No usual interval	11. Maintenance interval usually is between 4 and 12 weeks. Terminally, the interval may be decreased to once a week
12. Not treated if condition ideal	12. Treated when condition ideal to keep it so
13. Sequence of remission and relapse is artefact of irregular therapy	13. Return to usual activities in 4 to 12 weeks, usually 6, and continue usual work and recreation until acute terminal stage
14. Danger of overtreatment is greater because of great biologic differences in radiosensitivity	14. Individual radiosensitivity guides therapy. (Only 2 of 163 patients were overtreated, and both recovered)
15. Total dose may kill the most radiosensitive cells, leaving radioresistant cells to multiply	15. Small doses used temporarily inhibit cell division, leaving radiosensitive cells present [7]
16. This method analogous to driving car by sharp turn of wheel only when it runs off the road or hits something	16. This method analogous to keeping car in center of proper lane by gentle, continuous adjustment of the wheel

TABLE 2.—*Leukemia Complications* and Their Treatment in 163 Patients*

Complications	Granulocytic, No. of Patients	Lymphocytic, No. of Patients	Treatment
Normocytic anemia			
Myelophthisic	48	64	Transfusions (iron, vitamin B_{12}, and liver of no value; folic acid harmful)
Acquired hemolytic anemia	1	17	Corticotropin (ACTH), cortisone, splenectomy
Erythrocytic hypoplasia	0	1	Stoppage of P^{32} temporarily, transfusions
Hypoplastic anemia	1	0	
Gastrointestinal hemorrhage	3	1	Peptic ulcer regimen, transfusions
Weakness and hypermetabolism	57	85	Graduated walking program
Chronic bronchitis with bronchiectasis	0	17	Penicillin and streptomycin initially, 1 gm. sulfonamide daily for life
Miliary tuberculosis	1	0	Streptomycin, para-aminosalicylic acid
Pneumonia	6	7	Penicillin
Pleural effusion	0	5	High protein diet, paracentesis, diuretics
Ascites	1	2	
Small stomach syndrome	51	53	High protein, high calory, low cellulose diet in six feedings daily until weight normal
Splenic infarction	8	1	Above, plus diphenhydramine (benadryl®) hydrochloride and morphine
Ruptured spleen	0	1	Antishock measures, splenectomy
Recurrent laryngeal nerve compression	0	1	Titrated P^{32}
Leukemic arthritis	1	0	No therapy effective
Migrating thrombophlebitis	0	1	
Leukemia cutis	1	1	
Subacute bacterial endocarditis	2	2	Antibiotics

* Many patients had several complications and associated diseases.

Twenty-three of the patients with chronic granulocytic leukemia died of an acute terminal phase of the leukemia, 10 of other causes probably related to the leukemia, and in an additional 10 the cause of death was probably chronic lymphocytic leukemia, however, the cause of death was probably unrelated to the leukemia. The higher incidence of death from degenerative cardiovascular disease in this group is again an expression of the older

mean age. Thus, 35.6% of all deaths to date of writing were unrelated to leukemia.

In table 5 are presented the major operations performed following the initiation of specific therapy for the leukemia. Tooth extractions and other procedures in infected areas often carry more hazard for the leukemic patient than more serious operations in sterile fields. In table 5 are also listed the three marriages and five pregnancies involving patients of this series, following the diagnosis and initiation of irradiation therapy for leukemia. No anomalies were found in the two children or three fetuses. Certainly the patient and his or her spouse should be informed of all the genetic and other risks. Should they still desire a child, it seems questionable whether it is always justifiable to insist on therapeutic interruption of the pregnancy. All of these patients were informed of the hazards and advised to avoid pregnancies.

TABLE 3.—*Occurrence of Unrelated Associated Diseases* in 163 Patients with Leukemia*

Unrelated Associated Diseases	Granulocytic, No. of Patients	Lymphocytic, No. of Patients
Carcinoma		
Skin	0	4
Bronchogenic	0	1
Pancreas	0	1
Appendix	0	1
Stomach	0	1
Prostate	0	1
Cervix	0	1
Cardiorespiratory		
Atherosclerotic heart disease	10	17
Hypertensive cardiovascular disease	5	12
Myocardial infarction	3	6
Congestive failure	7	11
Rheumatic heart disease	1	0
Syphilitic heart disease	1	0
Auricular fibrillation	1	4
Paroxysmal auricular tachycardia	0	1
Miscellaneous respiratory diseases	8	9
Gastrointestinal		
Peptic ulcer	3	4
Acute appendicitis	1	1
Postoperative peritonitis	0	1
Mesenteric thrombosis	0	1
Amebic dysentery	1	0
Cirrhosis of the liver	0	2
Miscellaneous	6	8
Genitourinary		
Pyelonephritis	2	4
Other genitourinary infections	1	9
Renal colic	1	0
Acute glomerular nephritis	1	0
Miscellaneous	3	5
Dermatological	4	8
Ophthalmologic	4	8
Neuropsychiatric		
Major psychoneurosis	2	2
Cerebral vascular accident	4	7
Bell's palsy	0	2
Tabes dorsalis	1	0
Primary optic atrophy	1	0
Endocrine		
Hypothyroidism	2	1
Diabetes mellitus	1	3
Addison's disease	1	0
Miscellaneous		
Rheumatoid arthritis	1	1
Complete situs inversus	0	1
Pernicious anemia	0	1
Chicken pox	1	0
Measles	1	0
No complications or associated disease	7	12

* Many patients had several complications and associated diseases.

DATA ON PATIENTS

This report includes every patient[11] with chronic granulocytic or lymphocytic leukemia, previously treated or not, who was referred for treatment from Jan. 1, 1941, to July 1, 1951, whether leukemic, subleukemic, or aleukemic. It includes, therefore, all 58 patients previously reported.[1] All data are complete to the exact date of death of the patient. Every patient was treated, and the exact status of each patient as of the date of death or the patient's last visit prior to Jan. 1, 1952, is known. All figures cited in this paper include death and disability from all causes during the course of leukemia.

TABLE 4.—*Direct Causes of Death in 163 Patients with Leukemia*

Causes of Death	Granulocytic, No. of Patients	Lymphocytic, No. of Patients	Total Deaths
Related to Leukemia			
Acute terminal phase of leukemia	23	7	30
Acquired hemolytic anemia	0	9	9
Incompatible transfusion	2	0	2
Cerebral vascular accident	4	4	8
Massive gastrointestinal hemorrhage	1	1	2
Bronchiectasis with massive hemorrhage	0	1	1
Subacute bacterial endocarditis	2	2	4
Miliary tuberculosis	1	0	1
Ruptured spleen	0	1	1
Total	33	25	58
%	76.7	53.2	64.4
Probably Unrelated to Leukemia			
Atherosclerotic heart disease and/or hypertensive cardiovascular disease			
With congestive heart failure	1	10	11
With myocardial infarction	2	4	6
Pulmonary infarction	1	2	3
Cerebral vascular accident	1	1	2
Pneumonia	0	3	3
Carcinoma	2	2	4
Uremia	3	0	3
Total	10	22	32
%	23.3	46.8	35.6
Grand total	43	47	90
%	100.0	100.0	100.0

TABLE 5.—*Major Operations* Performed During Course of Leukemia in 163 Patients*

Operations	Granulocytic, No. of Patients	Lymphocytic, No. of Patients
Splenectomy	0	4
Whipple procedure	0	1
Herniorrhaphy	0	1
Appendectomy	1	1
Nephrectomy	0	1
Kidney stone removal	0	1
Gastric resection	0	1
Suprapubic prostatectomy	0	1
Transurethral prostatectomy	1	1
Tubal ligation	4	0
Therapeutic abortion *	3	0
Fractures set	3	0
Total	12	12

* There were 3 therapeutic abortions, with all fetuses free of anomalies; there were 5 pregnancies, with 2 full-term, normal infants.

The age, sex, status, and type of leukemia are summarized in table 6. The nonprivate patients include all those referred by Multnomah County Hospital or the University of Oregon Medical School outpatient clinics. The great majority of these patients came from Portland or its immediate vicinity. One hundred and sixty-two patients were white; one was a Filipino. Normal mean life

3. Fisher, R. A.: Contributions to Mathematical Statistics, New York, John Wiley & Sons, Inc., 1950, papers 10, 11, and 24.

4. Boag, J. W.: Maximum Likelihood Estimates of the Proportion of Patients Cured by Cancer Therapy, J. Roy. Stat. Soc., Series B **11**: 15-53, 1949.

expectation of these patients was calculated by averaging the life expectation for white persons in the general United States population of the same sex and age as each patient at onset of the leukemia.[12]

RESULTS OF THERAPY

Criteria for objective evaluation of the results of therapy include the time of patients at usual activities, the time in hospital per leukemic year after therapy, the hemoglobin concentration, the leukocyte count, and the spleen size initially and at two arbitrarily chosen times

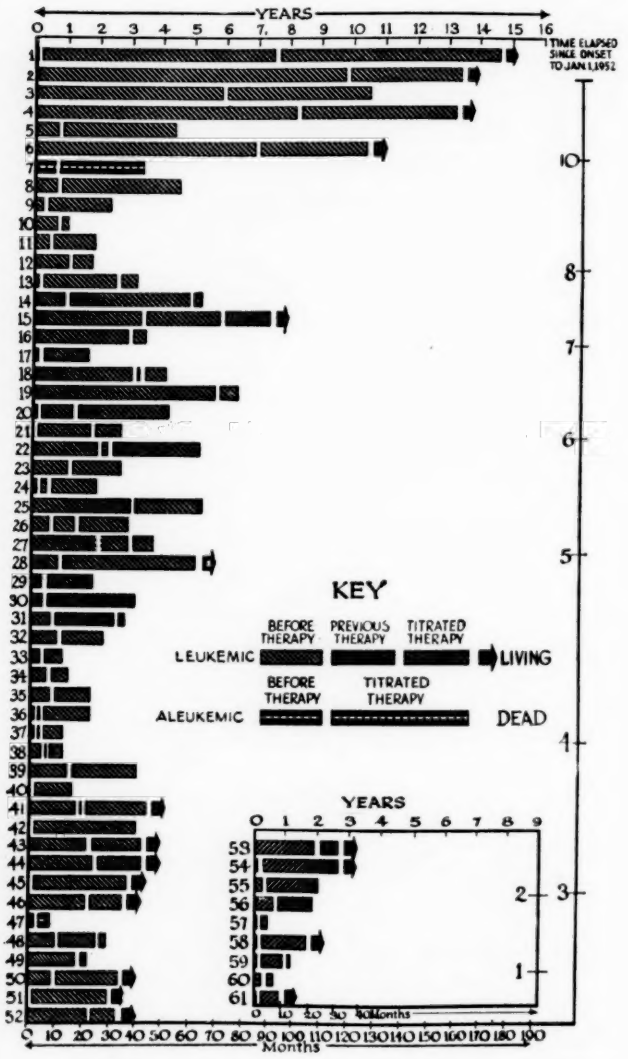

Fig. 2.—Survival times of 61 patients with chronic granulocytic leukemias arranged in sequence of onset of disease.

after therapy. The ultimate survival times from onset and after therapy were predicted by the "method of maximum likelihood" developed by Fisher,[3] Boag,[4] and Lea [5] and were applied to our data by Tivey.[2] The papers by Fisher, Boag, and Lea should be consulted for details of the method of maximum likelihood. The paper by Tivey should be consulted for references to the series totaling over 2,600 cases that are therein analyzed. Survival times in leukemia follow logarithm-normal distributions. Granulocytic and lymphocytic leukemias analyzed separately did not differ significantly in the prognosis for survival. The data in Tivey's [2] article constitute the basis for the assumption that the series here reported will also follow such a distribution.

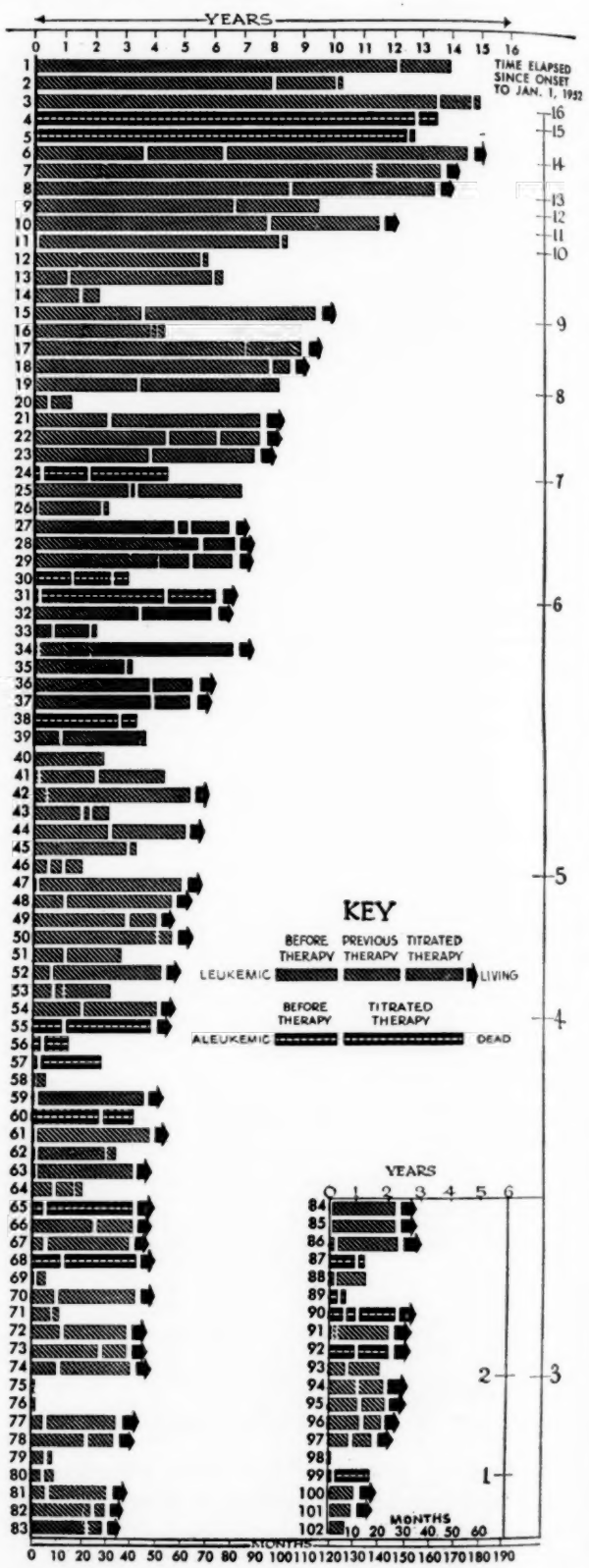

Fig. 3.—Survival times of 102 patients with chronic lymphocytic leukemias arranged in sequence of onset of disease.

An average of 85% of total patient life since onset of "titrated" therapy has been spent at usual activity and an average of only nine days per leukemic year was spent

in the hospital. The mean hemoglobin concentration values of the 109 patients with anemia when therapy was initiated who survived six months or longer had increased to (or almost to) the normal range at the two arbitrarily selected times after therapy. (These times were the nearest visit to six months after this therapy was started and the last visit prior to Jan. 1, 1952, or three months before death, whichever was applicable.) In the total series of 163 patients, 77 had required no transfusions to the closing date of this series. An average of only 3.4 (500 ml.) transfusions per leukemic year after therapy was required for the 163 patients, but these were very unequally distributed. Only 16 of the 59 previously untreated leukemic patients who lived six months or longer had leukocyte counts in excess of 30,000 at either of the two arbitrarily selected points after onset of therapy. Only 1 of these 16 had chronic lymphocytic leukemia.

Of the 95 patients whose spleens were initially enlarged, during normal respiration, to more than 1 cm. below the costal margin in the midclavicular line, the average spleen size at the initial visit was 8.7 cm.; at six months after start of therapy the average spleen size was 2.9 cm.; at the last visit or three months before death it was 3.2 cm. Some spleens initially 20 to 30 cm. below the costal margin became nonpalpable with only total body roentgen ray or radioactive phosphorus irradiation, although the regression was more gradual than with local irradiation. We have observed that spleens previously treated with local irradiation are less likely to show as marked a decrease in size, but these were also included in this analysis. The survival times of the individual patients in this series are shown in sequence of onset of the leukemia in figure 2 for the granulocytic leukemias and in figure 3 for the lymphocytic leukemias. Note that these distributions for the two types of leukemia completely overlap.

In figure 4 are shown, plotted on logarithmic probability paper, the predicted ultimate survival times before and after therapy for the patients reported in this article as well as the corresponding lines for the 1,978 patients in the literature [2] on whom adequate data for survival times after onset and the 651 patients on whom survival times after specific therapy were available. The logarithmic-mean or median, with its standard error and the standard deviation of the survival times for each distribution, is indicated. Three hundred and thirty patients treated by other plans of administering radioactive phosphorus were similarly analyzed.[2] The log-mean for these patients treated with radioactive phosphorus by other regimens was 0.518, its standard error was ± 0.0186, and the standard deviation of survival times was ± 0.319.

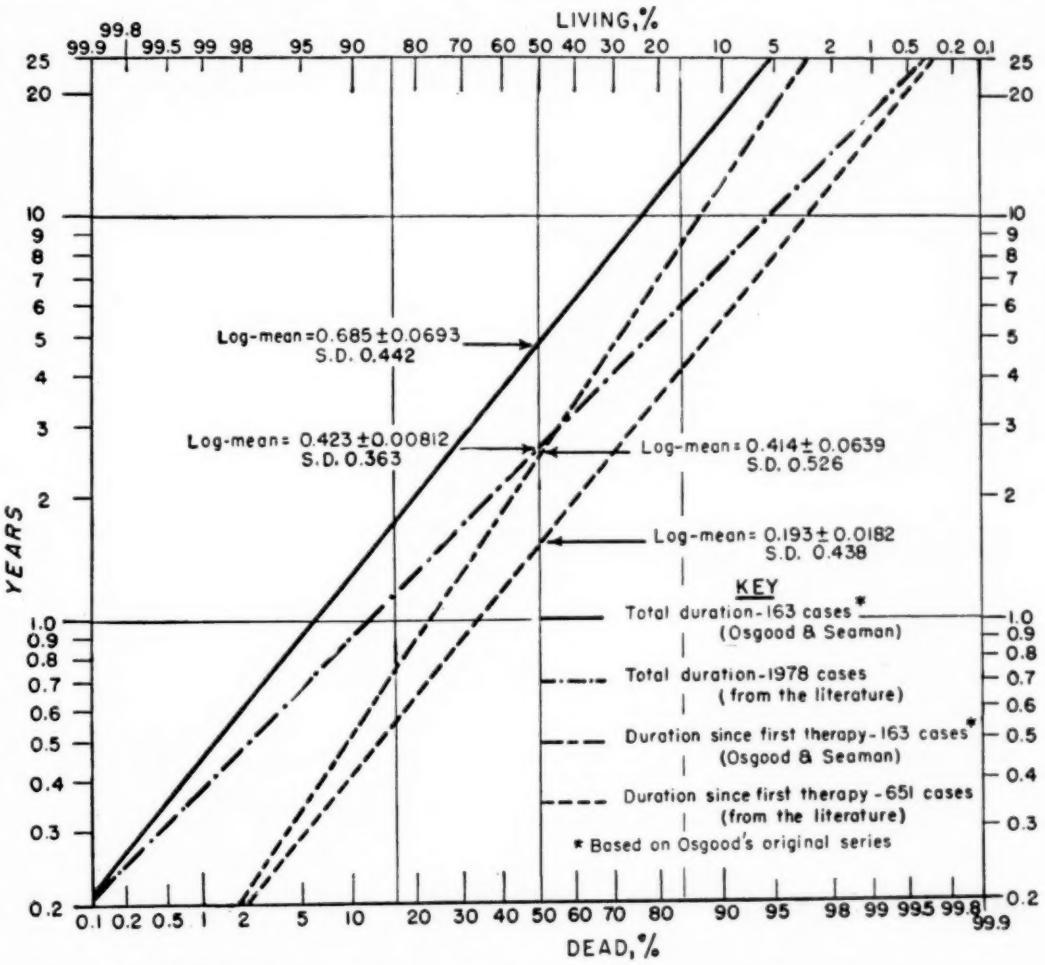
LIVING, %
99.8
99.9 99.5 99 98 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1
YEARS
25 20 10 9 8 7 6 5 4 3 2 1.0 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2
Log-mean=0.685±0.0693
S.D. 0.442
Log-mean= 0.423±0.00812
S.D. 0.363
Log-mean= 0.414± 0.0639
S.D. 0.526
Log-mean= 0.193± 0.0182
S.D. 0.438
KEY
Total duration-163 cases *
(Osgood & Seaman)
Total duration-1978 cases
(from the literature)
Duration since first therapy-163 cases*
(Osgood & Seaman)
Duration since first therapy-651 cases
(from the literature)
* Based on Osgood's original series
0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.5 99.8 99.9
DEAD, %

Fig. 4.—Predicted survival times of 163 patients in this series compared with corresponding values from the literature, plotted on logarithmic probability paper. Each curve should be read as if it alone appeared on the figure; e. g., 48% of this series versus 23% of the control series are predicted to live five years or longer after onset of leukemia, and 29% of this series versus 12% of the control series live five years or longer after start of therapy.

From these values it can be stated that there is less than one chance in a hundred that the predicted median survival time of the "titrated series" is not superior to the data from the literature, as regards survival time both after therapy and after onset of the disease. There is less than 1 chance in 40 that these results are not superior to

5. Lea, D. E.: The Biological Assay of Carcinogens, Cancer Research **5**: 633-640 (Nov.) 1945.

6. Osgood, E. E.: Differential Diagnosis and Treatment of the Leukemias, Northwest Med. **47**: 181 (March); 257 (April) 1948.

7. Osgood, E. E.; Aebersold, P. C.; Erf, L. A., and Packham, E. A.: Studies of the Effects of Million Volt Roentgen Rays, 200 Kilovolt Roentgen Rays, Radioactive Phosphorus, and Neutron Rays by the Marrow Culture Technique, Am. J. M. Sc. **204**: 372-381 (Sept.) 1942. Osgood, E. E.: Is the Action of Roentgen Rays Direct or Indirect? An Investigation of this Question by the Method of Human Marrow Culture, Am. J. Roentgenol. **48**: 214-219 (Aug.) 1942.

those for the combined totals of radioactive phosphorus treated patients reported by others.

The two curves for survival after onset of leukemia shown in figure 4 are replotted (fig. 5) on the more familiar arithmetical scale cut off at 16 years, 5 years less than the mean expectation of 21 years for normal persons of the same age (as indicated in table 6), with 100 previously "untreated" cases shown at the 1% intervals on the graph. Because all previous reports of the 163 patients in this series is slightly over four years, with 73 of the 163 still living. Only 4 of the 33 living patients included in the previous report [1] have died in the 18 month interval between closing dates. (The durations of the four patients after onset of leukemia were, respectively, 40, 40, 44, and 42 months.)

Unquestionably, the use of antibiotics, psychotherapy,[5] and modern treatment of all associated diseases have contributed to these results. It seems probable that the

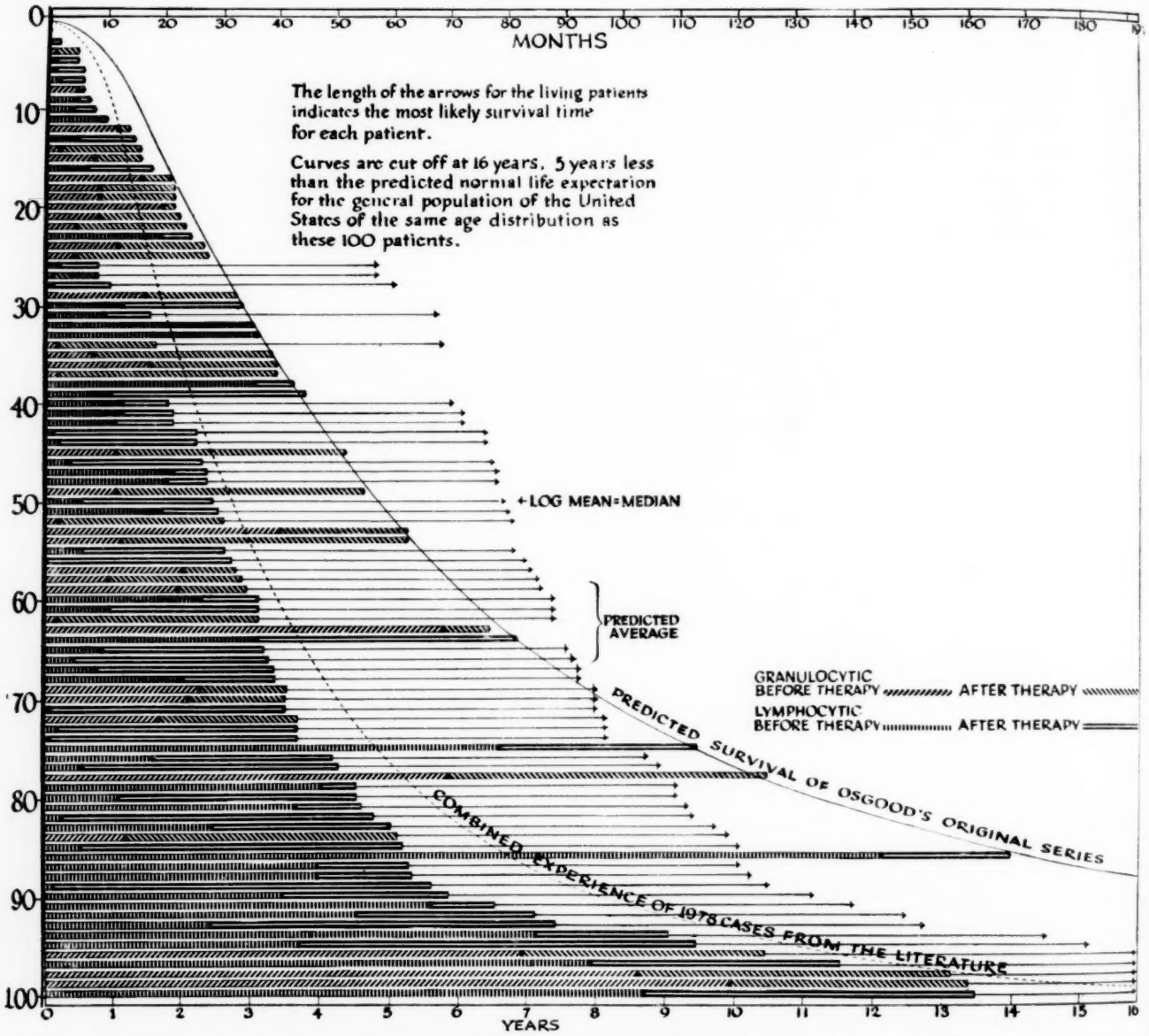
MONTHS
The length of the arrows for the living patients indicates the most likely survival time for each patient.
Curves are cut off at 16 years, 5 years less than the predicted normal life expectation for the general population of the United States of the same age distribution as these 100 patients.
+LOG MEAN=MEDIAN
PREDICTED AVERAGE
GRANULOCYTIC BEFORE THERAPY AFTER THERAPY
LYMPHOCYTIC BEFORE THERAPY AFTER THERAPY
PREDICTED SURVIVAL OF OSGOOD'S ORIGINAL SERIES
COMBINED EXPERIENCE OF 1978 CASES FROM THE LITERATURE
YEARS

Fig. 5.—Graphic illustration of 100 previously "untreated" leukemia patients (includes 3 patients treated by this method elsewhere before referral to this series; 2 patients received urethane for less than one month before therapy) arranged in sequence of survival times for comparison with predicted logarithm-probability curves for this series and for 1,978 patients from literature. Length of each arrow represents a point midway between point where a patient's present duration touches predicted curve and 100. For example, patient in case 80 now touches predicted survival curve at 48, so he could not live less than this time; therefore, there is an equal chance of his living a longer or shorter time than patient in case 74, so length of arrow for case 80 corresponds to point on predicted curve for case 74. The 43 dead patients have been placed in their actual positions on the predicted curve, and the 57 living patients have been arranged in sequence of survival in the remaining gaps. Total life spans for dead and living patients together now exceed area under curve for combined experience of 1,978 cases from literature.

results of therapy in leukemia have included only the mean or average survival time and not the 50% survival time (median) or log-mean, the ultimate means for the series predicted by one of us (E. E. O.) on the log-normal assumption are included in the statistical summary (table 7) for comparison. The present mean survival time of patients treated with radioactive phosphorus by others had the benefit of such therapy. The major improvement may then be credited to the method of administration of a regularly spaced dose of total body roentgen or radioactive phosphorus irradiation adjusted to the individual patient's needs at the time, using as criteria for "titration"

that patient's response to previous therapy. This determined dose at the determined interval must be repeated while the condition of the patient is ideal. We do not stop administration of digitalis because the patient is no longer in congestive heart failure. Why should we discontinue regular therapy for leukemia because the patient is at the time symptom free?

Since the figures cited in this paper include death and disability from all causes, they may be compared directly with death rates for the general population of the same age and sex distribution; while, if the predictions are fulfilled, the mean life span will be approximately doubled and about 10% of the patients will achieve their normal life expectation, the results still leave much to be desired. On the average, patients with chronic leukemias treated by this method will achieve only about one-third of their normal expectation, a little better than this for the lymphocytic leukemias, and somewhat less than this for the granulocytic leukemias.

TABLE 7.—*Statistical Summary of Survival Time (in Years), This Series, Compared with the Literature*

Patients Living, %	84% = −1 S. D.[a]	50% = Median [a]	16% = +1 S. D.[a]	Estimated Final Average with 95% Range
Onset to first treatment				
163 patients (Osgood and Seaman)	0.11	0.77	1.7	2.0 ± 0.5
Time after first treatment				
1. 651 patients from literature	0.57	1.6	4.3	2.5 ± 0.5
2. 163 patients (Osgood and Seaman)	0.75	2.6	8.7	5.0 ± 1
Total duration				
3. 1,978 patients from literature	1.15	2.6	6.1	3.5 ± 0.3
4. 330 patients from P^{32} literature	1.58	3.3	6.9	4.8 ± 1
5. 163 patients (Osgood and Seaman) [b]	1.75	4.8	13.4	7.0 ± 1

Probabilities that differences in logarithms of medians shown are due to chance alone are:

1 vs. 2, P = < 0.01
3 vs. 5, P = < 0.001
4 vs. 5, P = < 0.025

[a] Based on Osgood's original series.[1]

TABLE 6.—*Age, Sex, and Status and Type of Leukemia of 163 Patients*

Decades	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	No.	Range, Yr.	Mean Age
Lymphocytic												
No.	0	0	1	6	15	28	35	15	2	102	27-81	58
%	0	0	1	6	15	27	34	15	2	100	.....	..
Mean normal expectation [12]	..	..	43	36	29	19	13	8	5	...	5-43	18
Granulocytic												
No.	1	1	7	13	9	12	14	4	0	61	3-71	48
%	2	2	11	21	15	20	23	6	0	100	.....	..
Mean normal expectation [12]	65	52	47	38	30	20	14	10	..	...	10-65	28
Total (lymphocytic and granulocytic)	1	1	8	19	24	40	49	19	2	163	3-81	54
Mean normal expectation [12]	65	52	46	37	29	20	14	9	5	...	5-65	21

Status		Granulocytic M	Granulocytic F	Granulocytic Total	Lymphocytic M	Lymphocytic F	Lymphocytic Total	Grand Total M	Grand Total F	Grand Total Total
Private										
	No.	25	25	50	52	22	74	77	47	124
	%	50	50	100	70	30	100	62	38	100
Nonprivate										
	No.	7	4	11	22	6	28	29	10	39
	%	64	36	100	79	21	100	74	26	100
Total		32	29	61	74	28	102	106	57	163
	%	52	48	100	73	27	100	65	35	100
Dead										
	No.	24	19	43	36	11	47	60	30	90
	%	56	44	100	77	23	100	67	33	100
Living										
	No.	8	10	18	38	17	55	46	27	73
	%	44	56	100	69	31	100	63	37	100

SUMMARY AND CONCLUSIONS

There is a statistically significant prolongation of life of patients treated by the program of therapy outlined, whether measured from onset of symptoms or as time after first specific therapy. There is less than one chance in a thousand that the predicted log-mean of this series is not significantly greater than the log-mean of 1,978 patients treated by various other methods, collected from the literature and analyzed by Tivey,[2] and less than 1 chance in 40 that the log-mean of our series is not greater than the log-mean of 330 patients from the literature treated with radioactive phosphorus, using other therapeutic regimens. As in the previously reported series, 85% of the post-therapy time of the 95 previously untreated leukemic patients was spent at their usual occupations and recreations. In 359 years of leukemic life after therapy, this group of patients averaged only nine hospital days and 3.4 (500 ml.) transfusions per leukemic year. Forty-seven patients had, up to Jan. 1, 1952, required no hospitalization, and 77 patients needed no transfusions.

While leukemia cannot be cured at present, it can be controlled for long periods of time. The prognosis for patients with chronic leukemias treated by the comprehensive program that is outlined here fully justifies a more optimistic outlook concerning the treatment of this disease and its complications.

3181 S. W. Sam Jackson Park Rd. (1) (Dr. Osgood).

8. Note that myelophthisic normocytic anemia is the name selected by the Committee for Clarification of the Nomenclature of Cells and Diseases of the Blood and Blood-Forming Organs, in their third report (Am. J. Clin. Path. **20**: 567, June, 1950), for anemia associated with marrow infiltration and that the definition clearly states that "the principal cause of the anemia may be diversion of nutrients to malignant cells, phagocytosis of erythrocytes or other less well understood mechanisms."

9. Berlin, R.: Red Cell Survival Studies in Normal and Leukemic Subjects, Acta med. scandinav. (supp. 252) **139**: 1-141, 1951.

10. Ross, J. F.; Crockett, C. L., Jr., and Emerson, C. P.: The Mechanism of Anemia in Leukemia and Malignant Lymphoma; abstracted, J. Clin. Investigation **30**: 668-669 (June) 1951.

11. One patient with chronic subleukemic neutrophilic leukemia and five patients with chronic monocytic leukemia, who were seen during the time period of this report and treated by this method, are not included in the analysis because of the small number of these rare types of leukemias.

12. Expectation of Life and Mortality Rates at Single Years of Age by Race and Sex, United States, 1949, Statist. Bull. Metrop. Life Insur. Co. **32**: 6 (Nov.) 1951.

PHYSICAL METHODS SIMULATING COUGH MECHANISMS

USE IN POLIOMYELITIS, BRONCHIAL ASTHMA, PULMONARY EMPHYSEMA, AND BRONCHIECTASIS

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and
H. Eugene Seanor, M.D., New York

The development of physical methods of eliminating bronchial secretions seemed to be especially desirable for patients who no longer had an effective cough, such as those with poliomyelitis and myasthenia gravis. In these conditions the majority of the fatal pulmonary complications are caused by atelectasis and secondary pneumonitis, which are the result of inability to expel saliva and mucopurulent exudate by an effective cough. Plugging of the bronchi by retained sputum may also impair respiratory function in such clinical entities as bronchial asthma, pulmonary emphysema, lung abscess, blocked tuberculous cavities, and pulmonary collapse following operations.

The purpose of this paper is to report the therapeutic use of physical techniques by which retained bronchial secretions have been effectively eliminated and to describe the physiological responses that are involved, at least in part, in the results achieved. The two methods developed to simulate some of the mechanisms of the human cough are based on somewhat different physical principles.[1] The first and more complicated apparatus consists of a modification of the immobilizing lung chamber, previously reported as a method that provided lung rest in patients with pulmonary tuberculosis. The principle of this technique depends on (*a*) explosive decompression of a pressure of 110 mm. Hg above atmospheric pressure to atmospheric pressure in 0.06 seconds and (*b*) a sudden application of pressure to the chest wall at the start of expiration. The patient, who is completely enclosed in a chamber, experiences an alternating pressure of one-seventh of an atmosphere 25 times a minute; this provides a tidal volume of one-seventh the volume of the lungs at the moment of decompression. Air leaves the chamber at high velocity because of the swift opening of a 5 in. (12.70 cm.) valve in the head end. A close fitting baffle surrounding the neck of the patient delays the outlet of air from the body compartment until a differential pressure of 40 to 50 mm. Hg is exerted on the chest wall and abdomen.

The abdominal viscera are projected forward on the diaphragm as a result of the initial, transient increase in pressure in the body compartment. This differential pressure applied to the thorax and abdomen is essential for the production of a high volume expiratory flow rate and elimination of mucopurulent exudate. Simple decompression at these pressures, approximately 2 lb. (0.9 kg.) per square inch, was not of value in clinical and experimental studies.[1] In Bloxsom's device,[2] a similar pressure change is produced 1.2 times a minute; the minute volume of ventilation would, under these circumstances, be about 5% of that required for resuscitation of infants, and the volume flow rates of air during the respiratory cycle would be, therefore, far less than those employed in normal breathing, and, hence, exercise no physiological influence on the movement of retained secretions. Studies on anesthetized dogs by Apgar [3] indicated the inadequacy of the Bloxsom air-lock as a resuscitating device.

The second physical method developed to eliminate mucopurulent secretions from the respiratory tract is called "exsufflation" and is simpler in application. The lungs are first expanded by a pressure of 40 mm. Hg. This is generally achieved by placing the patient in the conventional tank respirator with the head outside; after a negative intratank pressure of 40 mm. Hg is produced by a vacuum cleaner blower, a sudden opening of a 5 in. valve attached to the chamber permits the pressure to rise to the atmosphere in 0.06 seconds. The relaxation pressure of the lungs and surrounding structures is then largely responsible for a high volume expiratory flow rate. The intratank negative pressure, which has maintained inflation of the lungs, disappears after the first 0.06 seconds. In other forms of artificial ventilation or intermittent pressure breathing the lung inflating pressure is gradually decreased during expiration, which results in a relatively slow air movement. The mechanical cough chamber and the exsufflator * are seen in figures 1 and 2.

By the use of radiopaque material the bronchi were found markedly dilated as a result of a pressure of 40 mm. Hg, a circumstance that would facilitate the passage of air beyond an occluding mucous plug into previously unventilated alveoli; furthermore, the entire bronchial tree shortens and contracts at the start of the succeeding expiration. The viscera are also moved forward on the diaphragm as the intratank pressure changes from –40 mm. Hg to atmospheric pressure. The sum of these factors in mechanical exsufflation result in a swift movement of air from the lungs during the beginning of the expiratory cycle. A similar result may be obtained by

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Mr. William Smith gave technical assistance.

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Because of space limitations, the tables and some of the bibliographic references have been omitted from THE JOURNAL and will appear in the authors' reprints.

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1*a*. Barach, A. L.; Beck, G. J.; Bickerman, H. A., and Seanor, H. E.: Mechanical Coughing: Studies on Physical Methods of Producing High Velocity Flow Rates During the Expiratory Cycle, Tr. A. Am. Physicians **64**: 360, 1951.

1*b*. Barach, A. L.; Bickerman, H. A., and Beck, G. J.: Advances in the Treatment of Non-Tuberculous Pulmonary Disease, Bull. New York Acad. Med. **28**: 353, 1952.

2. Bloxsom, A.: Resuscitation of the Newborn Infant, Use of the Positive Pressure Oxygen-Air Lock, J. Pediat. **37**: 311, 1951.

* Exsufflator produced by the O. E. M. Corporation, Norwalk, Conn., were used in many cases. An improved model, manufactured by the DeFlorez Co., New York, is currently being used.

increasing the positive pressure on the upper respiratory passageway, using either a dome or a mask; in this instance the swift opening of a 5 in. valve results in a rapid fall in positive intrapulmonary pressure.

The maximal expiratory volume flow rates produced by exsufflation in normal subjects were found to be approximately 60% of those recorded during the most vigorous cough of these persons.[4] A spirometer with a fast moving drum was employed to measure the volume of air moved in 0.125 seconds at the start of expiration. In six patients with poliomyelitis with breathing difficulties that required intermittent use of the tank respirator, the maximal expiratory flow rate produced by exsufflation was 145% of that recorded with their own most powerful cough.[1e] Since forcible manual compression of the lower thorax and abdomen will, itself, move air out of the lungs at an increased velocity, the addition of this maneuver to exsufflation results in a still higher expiratory flow rate. Similarly, negative pressure has been applied to the upper respiratory passageway in conjunction with exsufflation to increase the gradient of pressure from the lungs to the atmosphere. The application of a pressure of −20 mm. Hg to the upper respiratory passageway, by means of a mask or dome of the respirator, during the release of the negative intratank pressure of 40 mm. Hg, increases the effectiveness of exsufflation, since an additional compressing pressure of 20 mm. Hg is then exerted on the chest wall.[1e]

The foot of the respirator was elevated to place the patient in the head-down position and thereby facilitate bronchial drainage. The increased relaxation pressure of the lungs was found to result in a conspicuous relief of dyspnea in patients with pulmonary emphysema, as will be discussed later.[1e] Otis, Rahn, and Fenn [5] reported a rise in the relaxation pressure of the lungs of approximately 7.5 mm. Hg when normal subjects were tilted

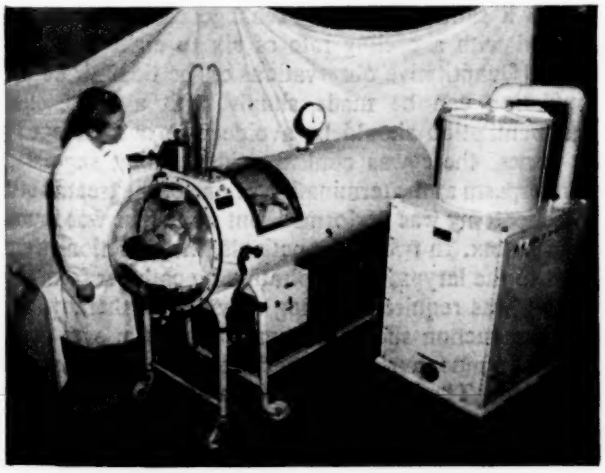

Fig. 1.—The mechanical cough chamber. The swift opening of a 5 in. (12.70 cm.) valve in the head end of the chamber results in explosive decompression and, by means of a close-fitting baffle around the neck, in a differential pressure of 40 to 50 mm. Hg applied to the chest and abdomen at the start of the expiratory cycles.

from the standing to the supine position. Wade and Gilson [6] found that there was an increase in the reserve diaphragmatic movement when normal persons were tilted head-down at an angle of 45 degrees. Heckscher [7] described relief of dyspnea as a result of postural exercises and the head-down position in patients with pulmonary emphysema and bronchial asthma.

The effect of exsufflation on removal of radiopaque material from the bronchi of dogs was studied by roentgenograms; most of the introduced mucin thorotrast® (10 cc. of an aqueous suspension containing 24% tho-

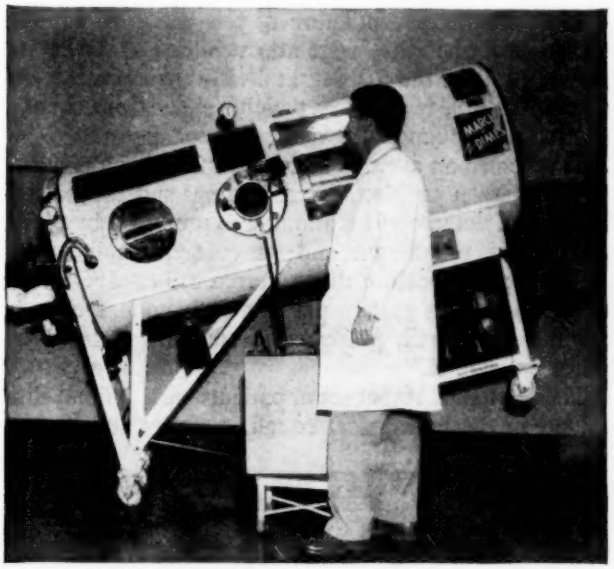

Fig. 2.—The exsufflator, seen on the stool on the floor, houses the motor blower unit and a mercury pressure switch that operates the solenoid and 5 in. valve attached to one of the arm portholes in the tank respirator.

rium dioxide thickened with 700 mg. of powdered gastric mucin) mixture was shown to be eliminated in one hour by the mechanical cough chamber and in two hours by the exsufflator; the tidal volume and the maximal expiratory volume flow rates in anesthetized dogs were markedly increased during exsufflation.[1d]

The effect of exsufflation on obstructive dyspnea, induced in healthy subjects by respiration through a 3 mm. orifice, revealed that the lowered alveolar pO_2 and elevated pCO_2 due to obstructed respiration returned to normal levels as a result of exsufflation; the peripheral venous pressure, which falls during inspiration through a constricted orifice, also returned to the normal level when the exsufflation procedure was applied.[8] It had been previously noted that the dyspnea and orthopnea of patients with bronchial asthma and pulmonary emphysema completely disappeared in the mechanical cough chamber and was markedly relieved in the exsufflator. A summary of the principles of operation and physiological data presented above concerning the mechanical cough chamber and the exsufflator is shown in table 1.

PHYSIOLOGICAL AND CLINICAL OBSERVATIONS IN PATIENTS WITH POLIOMYELITIS

Observations were made on maximal expiratory volume flow rates in the supine position with exsufflation, exsufflation at a 20 degree head-down position, and during a natural cough in five patients with poliomyelitis. The results are shown in table 2. It will be seen that four

4. Barach, Beck, and Bickerman.[1a] Barach, Bickerman, and Beck.[1b]
7a. Heckscher, H.: Emphysema of the Lungs, Its Symptoms and Relations to Other Diseases, Acta med. scandinav. **120**: 349, 1945.
8. Cherniack, R. M., and Gordon, C. A.: Effects of Exsufflation on Obstructive Dyspnea, J. Clin. Investigation, to be published.

of the five tested patients had an average maximal expiratory volume flow rate that was 55% higher during exsufflation in the head-down position than during their own most vigorous cough. In three patients exsufflation in the head-down position produced a higher volume flow rate than in the supine position; in two, there was no change.

The pulmonary ventilation of this group of patients was studied when they were at rest in bed in the supine position and in the 20 degree head-down posture. As seen in table 3, two of five patients showed no change, whereas the pulmonary ventilation of the remaining three revealed an average increase of 24% as a result of the head-down position. These findings suggest that the augmented volume of breathing was produced by elevation of the diaphragm and its consequent increased excursion; this posture may, therefore, improve respiratory function in certain patients with poliomyelitis in whom the muscular power of the diaphragm has been partially restored.

The individual responses of patients with poliomyelitis treated in the mechanical cough chamber and the exsufflator revealed a moderate to marked improvement of ventilation as a result of the consistent elimination of mucoid and mucopurulent secretions by both methods of treatment. (Tables A and B show the individual responses to treatment.) Of 16 patients, 13 were markedly improved and three moderately improved. In eight patients with pulmonary atelectasis, disappearance of atelectasis took place in all in a period of one to five days. The duration of an individual treatment was generally one-half hour; in many instances, two to five treatments were given daily for one to five days. In the beginning of the study, these procedures were used cautiously, but as subjective and objective evidence of benefit was observed, the number of treatments per day increased, since it was thought that a swifter resolution of the atelectatic process might take place in this way.

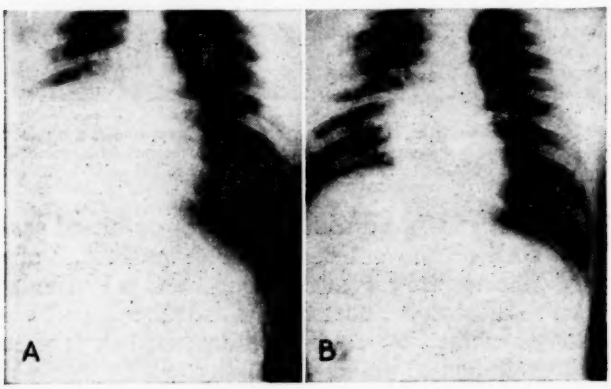

Fig. 3.—Clearing of pulmonary atelectasis demonstrated by roentgenograms before (*A*) and after (*B*) treatment in the mechanical cough chamber.

Of 15 patients with poliomyelitis and 1 with myasthenia gravis who required the respirator owing to dyspnea and the presence of mucopurulent secretions, 10 were removed from the respirator without dyspnea as a result of improved ventilation after treatment with either the mechanical cough chamber or the exsufflator. The subjective response was almost uniformly favorable, as the patients not only witnessed the presence of sputum and saliva in their mouths but generally felt a greater ease of breathing immediately afterward. In two patients who were returned to the respirator because of respiratory infection, treatment in the mechanical cough chamber was followed by ventilatory improvement that enabled the patient to breathe without aid of the respirator. Pulmonary atelectasis did not occur in any of these patients. Of two patients with the acute bulbospinal type, one had atelectasis involving the lower lobe, which cleared after one day of treatment, and the second experienced greater drainage from the airway than was obtained by the previously employed methods of therapy.

Of the 11 poliomyelitis patients who were treated in the exsufflator, all were respirator or postrespirator patients who required mechanical assistance for breathing because of respiratory infection and associated impairment of ventilation; 7 of these patients were able to leave the respirator after exsufflation therapy. Of the 17 patients who required artificial respiration, 10 were able to dispense with the respirator after elimination of bronchial secretions was accomplished by the cough chamber or exsufflator.

The technique of operation of exsufflation has been discussed in detail elsewhere,[1e] but certain precautions should be emphasized. Since a 40 mm. Hg pressure produces a high tidal volume, the cycling rate per minute is slower than in the conventional operation of the tank respirator. As seen in table 5, the tidal air varied from 1,000 to 2,500 cc. In three of five patients, the head-down position showed an average increase in tidal volume of 11% above that found when the patients were supine. In 10 normal subjects, when exsufflation was carried out with the head tilted down 18 degrees, the tidal volume increased 19% (mean result) over that in the supine position. A pulmonary ventilation adequate to provide a satisfactory gas exchange can generally be obtained with a cycling rate of six to eight times per minute. Quantitative observations of the tidal air during exsufflation can be made simply with a spirometer. Hyperventilation should be avoided. In one patient in this series, there was clinical evidence that suggested laryngospasm at the termination of one of the treatments. A tracheotomy was performed, but no mucus was found in the larynx. In two other patients, the secretions were blown to the larynx, and aspiration by catheter from the pharynx was required. During exsufflation therapy, appropriate suction should be available in the event that mucoid or mucopurulent expectoration is caught at the vocal cords. The head-down position is desirable during treatment of these patients, as bronchial drainage is more continuously produced, and plugging at the larynx is, therefore, less likely to occur.

Intratank pressures of 35 to 40 mm. Hg have, in no instance, resulted in a harmful effect. As has been pointed out previously,[9] the mean applied intrapulmonary pressure is lower with exsufflation than with routine operation of the respirator, because expiration is accomplished with positive pressure present only during the first 0.06 seconds of the cycle. With the addition of negative pressure in the dome, the mean ventilatory pressure is further decreased. The venous pressure rise caused by

9*a*. Barach, Bickerman, and Beck.[1b]

pressure breathing is also much less with exsufflation than with conventional, gradual pressure rise in the respirator. An additional possible advantage of inflating the lungs with a 40 mm. Hg pressure is that the rigid chest that develops in some patients with poliomyelitis might be less apt to develop if daily full expansion of the thorax is employed. In addition, exsufflation may become effective therapy for the prevention of small areas of atelectasis due to localized bronchial occlusions by retained saliva or mucus. The following four case histories illustrate the clinical use of the physical methods of eliminating bronchial secretions described above.

REPORT OF CASES

CASE 1.—A 21-year-old woman was admitted to Willard Parker Hospital with a diagnosis of spinal paralytic poliomyelitis with scattered weakness in both lower extremities. Shortly after admission, rapid extension of the disease took place, with slight involvement of the intercostal muscles and the diaphragm, nasal speech, nasal regurgitation, inability to cough, and hyperpyrexia. Physical findings of right middle lobe atelectasis and pneumonitis were confirmed by a roentgenogram of the chest. The patient was treated in the mechanical cough chamber ½ hour every 2 hours for 10 hours. Thick, tenacious mucous plugs were suctioned from the oropharynx. Following chamber therapy, a marked improvement in ventilation was evident. The respiratory excursions of the thorax and diaphragm, which had been markedly reduced over the right side of the chest, were normal bilaterally immediately after mechanical coughing. A roentgenogram of the chest taken directly after therapy revealed complete clearing of the atelectasis previously noted in the right middle lobe, as seen in the roentgenogram in figure 3.

CASE 2.—A 19-year-old man was admitted with a diagnosis of spinal paralytic poliomyelitis with involvement of the intercostals and diaphragm. The patient, who was unable to cough, manifested signs of a respiratory infection complicated by atelectasis of the middle and lower lobes of the right lung. He was treated by exsufflation for one-half hour every two hours for five days. During treatment, 2 to 3 oz. (30 to 60 gm.) of thick, purulent, blood-tinged mucus, containing innumerable plugs 1 to 2 cm. in diameter, were raised. Roentgenograms revealed complete clearing of the atelectatic areas on the 5th day of cough therapy and a shift of the heart and mediastinum to normal position on the 15th hospital day.

CASE 3.—A 13-year-old white girl acquired a respiratory infection that failed to respond to antibiotic therapy. Twenty-four hours later, she became dyspneic and was unable to clear her upper respiratory tree of mucopurulent secretions. Physical examination revealed diminished to absent breath sounds over the right upper lobe anteriorly, dullness over the same area, and a shift of the point of maximum impulse to the right. Roentgenograms revealed atelectasis of the right upper lobe. The patient was treated by exsufflation at pressures of –40 mm. Hg for periods of 15 minutes four times a day for three days. On the third day, roentgenograms revealed clearing of the atelectasis, re-expansion of the right upper lobe, and a return of the mediastinum to normal position.

CASE 4.—A 28-year-old chronic respirator patient experienced signs and symptoms of an acute respiratory infection, which was shortly followed by segmental atelectasis of the right upper lobe. The patient was immediately started on exsufflator therapy and treated four times a day at pressures of –40 mm. Hg for periods of 20 minutes. Roentgenograms one day after exsufflation revealed clearing of the atelectasis. During the course of exsufflator therapy, copious amounts of seropurulent material were aspirated from the oropharynx.

CASE 5.—A 6-year-old girl was admitted with acute spinal paralytic poliomyelitis, involving all four extremities and eventually the muscles of respiration, necessitating the use of the tank respirator. Over a period of weeks, the patient was weaned from the respirator, but early in her convalescence, a respiratory infection developed, which was quickly followed by total atelectasis of the left lung, with complete obstruction of the left main bronchus. The patient was placed in a tank respirator in an effort to increase her ventilation. Two bronchoscopies failed to result in the removal of the occluding bronchial plug because of its extent and tenacity. She was then treated by exsufflation for periods of one-half hour every two hours during the day for five days. An initial outpouring of thick, tenacious sputum was immediately followed by a marked improvement in ventilation. Roentgenograms revealed a partial resolution of atelectasis on the fourth day of therapy, with complete clearing, shift of the mediastinum to normal position, and removal from the respirator on the sixth day of exsufflation therapy; these changes are shown in figure 4.

PHYSIOLOGICAL AND CLINICAL OBSERVATIONS IN PATIENTS WITH BRONCHIAL ASTHMA, PULMONARY EMPHYSEMA, AND BRONCHIECTASIS

The mechanical cough chamber and the exsufflator were employed in clinical entities in which the patients' coughs did not result in effective removal of retained secretions. These included 31 patients with bronchial asthma, pulmonary emphysema, and bronchiectasis. Increased expectoration of mucopurulent sputum took place with both physical methods employed, with relief of dyspnea or persistent coughing; as seen in table 6, marked clinical improvement was observed in 6 of 10

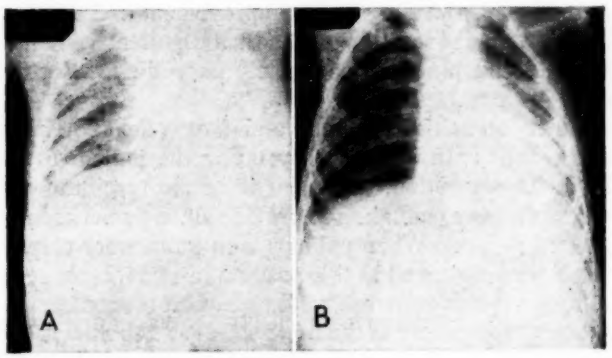

Fig. 4.—Clearing of pulmonary atelectasis demonstrated by roentgenograms before (*A*) and after (*B*) exsufflation.

patients with bronchial asthma, 6 of 10 with bronchiectasis, and 2 of 11 with pulmonary emphysema. Moderate improvement took place in five patients with pulmonary emphysema, four with bronchial asthma, and four with bronchiectasis. (The individual response to treatment with the mechanical cough chamber and the exsufflator are indicated in tables C and D.)

Although patients with these clinical entities frequently cough, collapse of the bronchi may take place during the cough as a result of an excessive intrapulmonary pressure, as is shown by Dayman,[10] and Andrews.[11] The widening of the entire bronchial tree because of exsufflation presumably facilitates aeration of areas of the lung that have been previously inadequately ventilated. In some patients, increased expectoration of mucoid or mucopurulent secretions took place after as well as during the period of treatment. The following case history illustrates a dramatic result of mechanical exsufflation in a patient with status asthmaticus:

CASE 6.—A 69-year-old woman with bronchial asthma of 20 years' duration was admitted to the hospital because of intractable status asthmaticus of one month's duration. The patient

10. Dayman, H. G.: Mechanics of Air Flow in Health and in Emphysema, J. Clin. Investigation **30**: 1175, 1951.

had beeen treated with cortisone, corticotropin (ACTH), fever therapy, bronchodilator drugs, and antibiotics, without perceptible relief of severe bronchospasm. Immediately following admission, a therapeutic bronchoscopy with bronchial suction under deep ether anesthesia was instituted. Although thick, tenacious, white sputum was removed during the procedure, the patient manifested extreme obstructive dyspnea, marked respiratory insufficiency, and a shock-like state. She seemed unable to raise any mucus. Her breathing increased in rate and became more shallow. She was cyanotic even during the inhalation of 60% oxygen at 2 cm. positive expiratory pressure. At that time, she was put in the exsufflator. Three 10-minute intervals of 40 mm. Hg pressure, cycling rate 12, were given with 5 minute intervals between them. During that time, 90 cc. of thick, tenacious mucus and innumerable mucous plugs were expectorated by the patient. A marked improvement in ventilation was apparent immediately after removal from the exsufflator. A second similar treatment resulted in more coughing of mucus, which was not measured. The patient was then completely relieved of dyspnea and cyanosis, even without oxygen. Breath sounds were clearly audible, with a few wheezing rales heard on full inspiration. A state of grave respiratory insufficiency and intractable asthma was terminated by elimination of mucous plugs in the bronchi that were not reached by bronchoscopy suction.

In one patient with persistent lung abscess and one with unresolved virus pneumonia, exsufflation was followed by expectoration of large amounts of mucopurulent sputum with progressive improvement and recovery after treatment for one week. In the patient with lung abscess, coughing was completely unproductive for five days prior to treatment.

Since bronchial drainage and lung relaxation pressures were both increased by tilting the patient to the head-down position, the foot end of the respirator was raised during exsufflation to provide an angle between 10 and 18 degrees. When patients with pulmonary emphysema were observed in this position, a remarkable relief of dyspnea was apparent, with an almost immediate cessation of the raising of the upper chest and shoulders and the neck muscle contraction characteristic of their difficult breathing in the sitting and standing positions. A similar, although less marked beneficial result, was observed in patients with bronchial asthma who were previously orthopneic.

Observations of 11 patients with pulmonary emphysema by fluoroscopy and roentgenograms in inspiration and expiration showed that diaphragmatic excursion was increased approximately 3 cm. when the patients were tilted from the head-up to the head-down position. The diaphragm, elevated by the pressure of the viscera, was in a more expiratory position, and, hence, capable of increased contraction during inspiration, with greater movement of the reserve air and conspicuously improved ventilation of the lower lobes of the lungs.

The effect of viscerodiaphragmatic breathing on pulmonary ventilation in 11 patients with pulmonary emphysema is given in table 7, in which it will be seen that an average decrease of 16.7% and 26.2% took place when these patients were tilted to the supine and head-down positions, respectively. More efficient alveolar ventilation is suggested by the response of a patient illustrated in table 8, in whom the arterial oxygen saturation rose from 67.7 to 76.1% when the posture was changed from the sitting to head-down 10 degrees. Even though the pulmonary ventilation decreased 20%, no rise in pCO_2 or fall in pH took place. Other studies in progress indicate that the increased diaphragmatic excursion accomplished in this way relieves dyspnea by improving gas exchange in the lungs in patients with pulmonary emphysema and in some patients with bronchial asthma.

COMMENT

Although the use of exsufflation is relatively simple in practice, in contrast to the more complex design and operation of the mechanical cough chamber, its therapeutic value depends on alteration of a variety of respiratory physiological functions. The marked dilatation of the bronchi at an inspiratory pressure of 40 mm. Hg facilitates ventilation of alveoli that may not be adequately aerated by the patients' relatively small tidal air volumes. The swift termination of the peak pressure is followed by expiratory contraction as well as shortening of the entire bronchial tree. The expiratory volume flow rates, which are highest at the start of expiration as a result of the relaxation pressure of the expanded lungs, are approximately similar to those of moderately vigorous coughs in normal persons but generally higher than those obtainable by patients with respiratory difficulties such as those present in poliomyelitis. These responses to exsufflation take place only when the patients are relaxed and cooperative, since the chest may be held rigid by deliberate contraction of the inspiratory musculature.

The cessation of lung inflating pressure after the first 0.06 seconds of expiration allows the lungs to collapse more swiftly than other forms of artificial respiration, in which a gradual fall of expiratory pressure opposes elastic recoil of the lungs. Ventilation is also achieved with a lower mean pressure than that required for other types of supra-atmospheric intermittent pressure breathing. The diminution in cardiac output produced by intermittent pressure breathing was reported to be more marked when administered by devices that had a prolonged expiratory pressure curve.[12] Since the effect on the return of blood to the right heart is directly related to the mean applied intrapulmonary pressure, with continuous or intermittent pressure breathing,[13] exsufflation (because of the virtual absence of pressure in the expiratory cycle) provides a method for mechanical ventilation with an unusually low mean pressure and, therefore, with less hazard to the circulation than that produced by conventional operation of the tank respirator apparatus.

SUMMARY

Two physical techniques that simulate the physiological mechanism of the human cough are described: 1. The mechanical cough chamber makes use of a modification of the immobilizing lung chamber by which explosive decompression is combined with a differential compressing pressure on the chest wall and abdomen. 2. The mechanism of exsufflation, much simpler in design and operation, is dependent on a full expansion of the lung by means of a negative pressure of 40 mm. Hg in the conventional respirator. When this pressure is abruptly terminated, the relaxation pressure of the

12. Motley, H. L., and others: Intermittent Positive Pressure Breathing: Means of Administering Artificial Respiration in Man: Council on Physical Medicine, J. A. M. A. **137**: 370 (May 22) 1948.

13. Barach, A. L.; Fenn, W. O.; Ferris, E. B., and Schmidt, G. F.: The Physiology of Pressure Breathing: A Brief Review of Its Present Status, J. Aviation Med. **18**: 73, 1947.

lungs and chest wall is largely responsible for a high expiratory volume flow rate. The dilatation of the bronchial tree at the peak pressure of 40 mm. Hg facilitates entrance of air into the alveoli during inspiration, and the contraction and shortening of the bronchi during expiration contributes to production of high volume expiratory flow rates that approximate those produced by vigorous coughs of normal subjects. The maximal volume expiratory flow rates produced by exsufflation in patients with infantile paralysis generally exceeds that of their most vigorous cough. The addition of negative pressure applied to the upper respiratory passageway increases the effectiveness of the exsufflation procedures.

The use of the mechanism described in patients with poliomyelitis resulted in the clearing of pulmonary atelectasis in all eight treated patients. In 10 of 16 patients, including one with myasthenia gravis, the elimination of bronchial secretions was followed by marked improvement in ventilation and ability to dispense with the respirator without dyspnea.

The value of mechanical methods of eliminating mucopurulent sputum was also revealed in the majority of 31 patients with bronchial asthma, pulmonary emphysema, and bronchiectasis, especially in respect to relief of cough and dyspnea. A case history is recited of a patient with status asthmaticus whose condition was exceedingly grave before treatment and in whom use of the exsufflator resulted in expectoration of mucopurulent plugs, immediate and complete relief of dyspnea, disappearance of cyanosis, and the establishment of a complete clinical remission.

The chamber was tilted to a head-down position to facilitate bronchial drainage and increase the relaxation pressure of the lungs. The effect of elevating the diaphragm by upward pressure of the viscera resulted in a striking relief of dyspnea in patients with pulmonary emphysema. A marked increase in reserve diaphragmatic excursion was observed during fluoroscopy and in roentgenograms. The pulmonary ventilation in 11 patients with pulmonary emphysema was decreased 26% when the posture was changed from the sitting to the head-down position. The beneficial effects of "viscerodiaphragmatic breathing" appear to be caused by more efficient ventilation of the previously poorly aerated lower lobes of the lungs.

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INTERMITTENT POSITIVE PRESSURE BREATHING IN EMPHYSEMA OF CHRONIC LUNG DISEASES

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There is abundant evidence in the current medical literature that a considerable portion of the disability found in a number of chronic pulmonary diseases is not the result of organic disease but of disturbed pulmonary physiology.[1] Much of the disturbed function centers about obstruction of the airway, impaired breathing mechanics, and hypoxia. Airway obstruction was found to be largely the result of bronchiolar narrowing caused by accumulated secretions, mural thickening, mucosal edema, and bronchospasm. Therapeutic measures for the relief of bronchospasm, pulmonary infection, impaired breathing mechanics, and hypoxia have frequently met with good results and have demonstrated that some of these impaired functions were reversible.[2] Among the successful methods used was a technique employing intermittent positive pressure breathing combined with simultaneous nebulization of a bronchodilator drug.[3] This report deals with our two years' experience with this treatment in the care of 200 consecutive patients with chronic pulmonary disease.

The patients discussed in this paper are the first 200 patients with chronic pulmonary disease treated by us. The only selection of cases occurred before the treatment was given; the process of selection was directed entirely toward the elimination of patients who might be harmed by the procedure. Table 1 lists the conditions treated in this series. As might be expected, most of these patients were at an advanced stage of their disease.

Prior to therapy all patients were studied by means of a complete history, physical examination, blood cell counts, sedimentation rate, hematocrit, urinalysis, serologic tests for syphilis, electrocardiogram, chest fluoroscopy, and roentgenograms made during inspiration and expiration (posteroanterior and left lateral views). Other studies, such as circulation time, bronchoscopy, planigrams, bronchograms, and sputum cultures were done when indicated. Most of these patients (170) obtained maximal breathing capacity and vital capacity determinations and spirograms before therapy. (A large

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1. Wright, G. W., and Filley, G. F.: Pulmonary Fibrosis and Respiratory Function, Am. J. Med. **10**: 642, 1951. West, J. R.; Baldwin, E. deF.; Cournand, A., and Richards, D. W., Jr.: Physiopathologic Aspects of Chronic Pulmonary Emphysema, ibid. **10**: 481, 1951. Gordon, B., and Motley, H. L.: Pathological and Physiological Factors Involved in the Treatment of Silicosis in Coal Miners, A. M. A. Arch. Indust. Hyg. **2**: 365 (Oct.) 1950.

2. Gordon, B., and others: Considerations of the Clinical and Physiologic Factors in the Treatment of Chronic Pulmonary Conditions, Dis. Chest. **19**: 271, 1951.

3. Motley, H. L., and Tomashefski, J. F.: Treatment of Chronic Pulmonary Disease with Intermittent Positive Pressure Breathing: Evaluation by Objective Physiological Measurements, A. M. A. Arch. Indust. Hyg. **5**: 1 (Jan.) 1952.

13.5 liter Benedict-Roth modified gasometer equipped with a high velocity, low resistance directional valve was used.[4]) The effect of the therapy was evaluated by means of repeated physical examinations, laboratory studies, roentgenograms, spirometric measurements, and effect on symptoms. Some patients lived at a great distance and had not been seen recently; a questionnaire was completed by these patients prior to the tabulation of this report.

TABLE 1.—*Diseases in Which Intermittent Positive Pressure Breathing Was Used*

Disease	Number of Patients
Emphysema	167
Asthma	35
Bronchiectasis	35
Pneumonoconiosis	20
Pulmonary fibrosis	22
Cor pulmonale	13
Pulmonary tuberculosis	9
Chronic bronchitis	8
Fibrothorax	1
Pericarditis	1
Lipid pneumonia	1
Hemosiderosis	1
Total	313

All these patients were treated with the Bennett pressure-therapy unit (model TV-2P). This unit simultaneously administers a gas and any desired aerosol. Its pressure characteristics are such that it provides a slowly rising inspiratory pressure and a rapidly falling expiratory pressure that promotes the movement of sputum from the smaller to the larger bronchi and the trachea. The instantaneous flow rate is adequately high for all types of dyspneic patients. The physiological effects of this and similar equipment have been thoroughly studied.[5]

All the patients were treated with 100% oxygen and aerosols of various medications. Three types of aerosol material were used: bronchodilators, antibiotics, and wetting agents. Three potent bronchodilators were used with about equal success. They were isopropylarterenol (isuprel®) hydrochloride (1 to 200 dilution), aerolone compound® (cyclopentamine and isopropylarterenol compound), and racemic epinephrine solution (vaponephrin®). Individual patients seem to have better response to one particular drug. Isopropylarterenol hydrochloride and aerolone compound® appear to be the drugs of choice for those patients who have complicating hypertension or coronary insufficiency, because these drugs caused elevation of the blood pressure or pulse rate less frequently. Sensitization to these materials was rarely noted. Six to 12 drops of the bronchodilator were administered in each treatment.

Patients with evidence of respiratory tract infection received antibiotics. Not all of the antibiotics were well tolerated as aerosols. Penicillin, streptomycin, and terramycin were used to good advantage for short periods of time. Sensitization to antibiotics administered by this method seemed more likely to occur than if they were given parenterally, but few instances of this phenomenon were observed; however, the use of antibiotics as aerosols was avoided in patients suspected of having the allergic diathesis. The dosage varied with the severity of the infection. It is almost essential to determine the antibiotic sensitivity of the offending organism before therapy is instituted. Antibiotics were usually given a few days at a time. A patient known to be sensitive to the parenteral administration of an antibiotic should not be given this material by aerosol.

Cetylpyridinium (ceepryn®) chloride was the only wetting agent used. This material reduces surface tension and has a mild bacteriostatic effect. It promotes the loosening of sputum. Four drops of a 1:1,000 solution of the material were added to the aerosol mixture for those patients who had difficulty "raising" sputum. Occasionally, a patient was slightly nauseated by the material.

The specific method of treatment was as follows: The medicaments to be aerosolized were placed in the nebulizer with about 1 cc. of distilled water or isotonic sodium chloride solution. The machine was then applied to the patient's airway by means of a mask or rubber mouthpiece, with or without a nose clip. Although some patients found the mask more comfortable, others preferred the mouthpiece. We believe that the latter is more efficient, because it eliminates the "baffle" effect of the nasal passages, thereby favoring more direct entry of the aerosol into the trachea. The control pressure was then adjusted. A pressure of 20 cm. of water was generally used. Occasionally, a more beneficial response was obtained when the pressure was increased to 30 cm. of water. This usually occurred in persons having pulmonary fibrosis. Patients who gave a history of spontaneous pneumothorax or who had large pneumatoceles were frequently treated with a pressure of 10 to 15 cm. The value of this reduced pressure in preventing complications is as yet undetermined, although we had no further difficulty with

TABLE 2.—*Results of Treatment of Total Group*

Number of patients	200
Average age	57 years
Average number of treatments	74
Average days treated	41
Average treatments per day	1.8
Deaths	11 (5.5%)
Unrelated	6
Terminal	2 (Cor Pulmonale)
Pulmonary suppuration	1
Spontaneous pneumothorax	2

Clinical Improvement

Worse	1.5%	Slightly better	27%	Much better	18%
Same	11%	Moderately better	36%	"Cured"	1%

Measurements (170 Cases)

	Vital Capacity	Change	Maximal Breathing Capacity (Liters per Minute)	Change
Before	2,249 cc.	.....	32	.....
After one treatment	2,472 cc.	+9.9%	42	+31%
After course	2,732 cc.	+21%	55	+71%

4. This instrument was obtained from Warren E. Collins, Inc., 555 Huntington Ave., Boston 15.

5. (*a*) Cournand, A.; Motley, H. L.; Werko, L., and Richards, D. W., Jr.: Physiological Studies of the Effects of Intermittent Positive Pressure Breathing on Cardiac Output in Man, Am. J. Physiol. **152**: 162, 1948. (*b*) Motley, H. L.; Werko, L.; Cournand, A., and Richards, D. W., Jr.: Observations on the Clinical Use of Intermittent Positive Pressure, J. Aviation Med. **18**: 417, 1947. (*c*) Motley, H. L., and Tomashefski, J.: Effect of High and Low Oxygen Levels and Intermittent Positive Pressure Breathing on Oxygen Transport in the Lungs in Pulmonary Fibrosis and Emphysema, J. Appl. Physiol. **3**: 189, 1950. (*d*) Motley, H. L.: Symposium: Pediatric Aspects of Inhalational Therapy: The Use of Oxygen in Comatose States, Bull. New York Acad. Med. **26**: 479, 1950.

spontaneous pneumothorax after the policy was adopted. The nebulizer was adjusted to produce a true aerosol and if possible to deliver all of the medication within the 20 minute treatment period.

When treatment is initiated many patients have a tendency to hyperventilate, and we occasionally have seen instances of mild tetany accompanied by carpopedal spasm. This can be easily avoided if all new patients are cautioned to breathe deeply and slowly (6 to 12 respirations per minute) and to allow adequate time for "complete" expiration. (The "flow-sensitive" valve makes it possible for the emphysematous patient to exhale to the limit of his ability before a new inspiratory cycle is begun.) Unavoidable coughing was not harmful to either the patient or the breathing unit. If sputum was raised during the procedure the patient was permitted to remove the mask or mouthpiece and expectorate; the treatment was then resumed. Treatment was given for 20 minutes. At the beginning of a course of therapy the treatments were given three times a day. Therapy was continued at this rate for about three weeks or as long as the patient continued to show progressive improvement, either by measurement or symptomatic relief. When a plateau in the patient's course was reached, the number of daily treatments was gradually reduced. As long as improvement was maintained, the reduction continued until the treatments were discontinued entirely. Some bronchiectatic patients were handled a little differently in that they received short courses (6 or 7 days) of pressure therapy at monthly intervals or during acute infections. Most bronchiectatic patients, however, were treated daily as described.

Table 2 presents an analysis of the entire group. It can be noted that the age group is relatively old. Of the entire group 7% became either worse or died; 11% were unchanged; and 82% improved. There were eleven deaths in the group. Six of these deaths occurred from unrelated causes and in patients not under therapy at the time of death; some causes of death were carcinoma of the lung, peptic ulcer with hemorrhage, rheumatic heart disease, and cerebral vascular accident. Two patients were in extremis with cor pulmonale at the onset of therapy, and no change was evident. A single patient with severe bronchiectasis died of an overwhelming pulmonary suppuration that was resistant to all known antibiotics. The last two deaths serve to stress one of the major contraindications to therapy. These two patients died of spontaneous pneumothorax. Neither of these patients was under our care during his terminal illness, and the diagnosis was overlooked in both cases. Their deaths should be ascribed to the treatment, although they might have been prevented had proper therapy been instituted. Both patients had a bullous type of emphysema, and their deaths were preceded by chest pain and a sudden increase in dyspnea several days before they died. Autopsy examination revealed spontaneous pneumothorax with evidence of ruptured bullae. This type of patient may be treated successfully with intermittent positive pressure breathing, but he must be carefully watched for any increase in the size of his pneumatocele or the develop-

TABLE 3.—*Responses to Treatment of 167 Emphysema Patients*

		Clinical Response						
Degree	No. of Patients	Deaths	Worse	Same	Slightly Better	Moderately Better	Much Better	"Cured"
Slight	23	..	..	3	6	7	7	..
Moderate	59	..	1	4	13	28	12	1
Advanced	56	2	1	6	18	23	6	..
Far advanced	29	6	..	5	5	8	5	..
Total	167	5% (8)	2% (2)	11% (18)	25% (42)	39% (66)	18% (30)	0.6% (1)

Measurements (104 Patients)

	Vital Capacity	Change	Maximal Breathing Capacity (Liters per Minute)	Change
Before	1,480 cc.	.....	29	.....
After one treatment	2,484 cc.	+68%	40	+37%
After course	2,720 cc.	+84%	51	+76%

TABLE 4.—*Responses to Treatment of Thirty-Five Patients with Bronchiectasis*

		Clinical Response						
Degree	No. of Patients	Deaths	Worse	Same	Slightly Better	Moderately Better	Much Better	"Cured"
Slight	8	..	..	..	2	4	2	..
Moderate	10	1	..	..	1	6	2	..
Advanced	14	1	..	2	3	5	3	..
Far advanced	3	..	..	..	2	..	1	..
Total	35	6% (2)	.....	6% (2)	23% (8)	43% (15)	23% (8)	0

Measurements (24 Patients)

	Vital Capacity	Change	Maximal Breathing Capacity (Liters per Minute)	Change
Before	2,360 cc.	.....	40	.....
After one treatment	2,668 cc.	+13%	51	+27%
After course	2,837 cc.	+20%	62	+55%

ment of pneumothorax. With such an occurrence pressure therapy should be stopped and measures to relieve the pneumothorax undertaken.

Table 3 summarizes the response of the 167 emphysema patients. Eighty-two per cent of these patients were noted to improve. In general those patients with a less severe type of disease improved the most. The subjective improvement usually took the form of increased exercise tolerance, easier breathing, decreased wheezing, decreased coughing, and increased appetite. Occasionally, the diaphragmatic excursion was noted to increase significantly. Patients manifesting bronchospasm by the presence of expiratory musical rales and rhonchi before treatment were generally found to do better.

other pulmonary disease tend to respond slightly better than patients with complicated cases. Occasionally, a patient with chronic asthma has been noted to have no further attacks and take no further medication for as long as eight months after treatment.

Twenty patients with pneumonoconiosis were treated. Fifteen cases were caused by silica, one by diatomaceous earth, one by iron, and three were of unspecified etiology. Table 6 shows the patients' responses. The manner of subjective improvement was generally an increased exercise tolerance, increased feeling of well-being, decreased coughing and wheezing, and increased appetite. A few of the patients were noted to raise increased amounts of gritty sputum during the first part of therapy.

TABLE 5.—*Responses to Treatment of Thirty-Five Patients with Asthma*

		Clinical Response						
Degree	No. of Patients	Deaths	Worse	Same	Slightly Better	Moderately Better	Much Better	"Cured"
Slight	3	..	..	1	1	..	1	..
Moderate	14	1	1	..	3	6	2	1
Advanced	15	..	1	1	7	2	4	..
Far advanced	3	..	..	..	2	..	1	..
Total	35	3% (1)	6% (2)	6% (2)	37% (13)	23% (8)	23% (8)	3% (1)

Measurements (23 Patients)

	Vital Capacity	Change	Maximal Breathing Capacity (Liters per Minute)	Change
Before	2,218 cc.	.....	35	.....
After one treatment	2,673 cc.	+20%	49	+17%
After course	2,873 cc.	+29%	58	+65%

TABLE 6.—*Responses to Treatment of Twenty Patients with Pneumonoconiosis*

		Clinical Response						
Degree	No. of Patients	Deaths	Worse	Same	Slightly Better	Moderately Better	Much Better	"Cured"
Slight	1	..	..	..	1	..	..	..
Moderate	10	..	..	2	5	2	1	..
Advanced	7	..	..	..	..	6	1	..
Far advanced	2	..	..	..	1	1	..	..
Total	20	.....	.....	10% (2)	35% (7)	45% (9)	10% (2)	0

Measurements (19 Patients)

	Vital Capacity	Change	Maximal Breathing Capacity (Liters per Minute)	Change
Before	2,084 cc.	.....	34	.....
After one treatment	2,478 cc.	+18%	39	+15%
After course	2,644 cc.	+26%	54	+59%

Table 4 indicates the responses of the 35 bronchiectatic patients treated. Little was expected in this group, but some of the most gratifying results were seen among these patients. With the exception of two patients who were being prepared for surgery, all of these patients were inoperable either because of extensive bronchiectasis or because of associated pulmonary disease. Their clinical improvement usually took the form of reduced coughing and expectoration, increased ease of expectoration, less frequent and less severe respiratory infections, and increased exercise tolerance.

Thirty-five patients with asthma were treated. Table 5 demonstrates the improvement of this group. A total of 86% were improved. This was usually manifested by decreased frequency of wheezing, coughing, and expectoration. Patients with asthma that is not complicated by

Twenty-two patients with pulmonary fibrosis were treated. An analysis of their responses is shown in table 7. The subjective improvement of this group was not unlike that of the emphysema group. Thirteen patients were thought to have cor pulmonale (table 8). None of them had the benefit of cardiac catheterization. This group of patients was extremely ill, and every method known to improve this condition was utilized. Under such circumstances it is difficult to evaluate the specific effect of a given procedure, but it was apparent that the intermittent positive pressure breathing aided remarkably in their management and occasionally appeared to be a lifesaving measure.

Certain conditions have come to be considered contraindications to this therapy. The presence of recent pulmonary hemorrhage or spontaneous pneumothorax is

considered an absolute contraindication to the treatment because of the hazard of perpetuating these conditions. Patients with active tuberculosis were excluded from this series, although other workers have had beneficial results in treating such patients. Recent myocardial infarction and coronary insufficiency warrant careful attention. It should be kept in mind when treating these patients that the aerosol administration of potent bronchodilators may produce a high blood stream concentration of these drugs. Some of these materials have been known to affect adversely the diseased cardiovascular system. Consequently, the bronchodilator should be carefully chosen and judiciously administered. The presence of congestive failure is not a contraindication; it may be responsive to this therapy; however, the treatment of acute pulmonary conditions is beyond the scope of this paper.

COMMENT

The incidence of mortality in this series is not an indictment of pressure breathing therapy. Emphysema, pulmonary fibrosis, pneumonoconiosis, and bilateral bronchiectasis are diseases that characteristically are slowly but inexorably progressive and attended by numerous and often fatal pulmonary and cardiac complications. As mentioned previously, several of the patients were in a terminal condition when first seen, and the treatment was not withheld unless absolute contraindications existed. It should be emphasized that the introduction of a new and promising therapy for a disease hitherto considered hopeless is likely to attract, initially, those patients who are in extremis.

Three patients died some time after treatment was discontinued as being ineffectual. Several died of causes totally unrelated to the pulmonary disease or the therapy. Two died of causes that might possibly be attributed to the treatment, such as bilateral pneumothorax and hemopneumothorax; however, these conditions are not infrequently seen as complications in untreated emphysema. In fact, spontaneous pneumothorax developed in two other patients while they were undergoing preliminary examinations and before any treatment was given. One was treated later without recurrence of the collapse. The other patient had a subsequent pneumothorax while under treatment that was indistinguishable from numerous pretreatment spontaneous attacks.

In the early and moderately advanced stages of emphysema, when spasm and edema of terminal bronchioles still predominate, pressure breathing is the most effective therapy we have encountered. In the end stages of this disease, when there is marked loss of alveolar elasticity, rupture of the walls, and obliteration of the capillaries, the use of intermittent positive pressure breathing is largely palliative. The patients feel better for a time, but the effect wears off in from one to several hours; however, it is a more efficient and also a safer way of administering oxygen than the use of nasal catheters, cannulas, tents, and, particularly, face masks. Comroe and associates have pointed out the dangers of administering high concentrations of oxygen by conventional methods to dyspneic and cyanotic patients who have far-advanced cases of emphysema.[6] We noted similar difficulties when we used conventional methods of oxygen therapy but have found intermittent positive pressure breathing singularly effective in combating respiratory acidosis and have not found it associated with any of the dangers described by Comroe. Motley has shown that intermittent positive pressure breathing properly administered actually increases the minute ventilation and facilitates the "blowing off" of carbon dioxide.[5d] Consequently, we have found that pressure breathing therapy not only increases the amount of arterial oxygen saturation over that produced by conventional administration, but it also is a much safer method of giving oxygen.

The gratifying response of patients with bronchiectasis to this therapy is, we believe, chiefly caused by promoting

TABLE 7.—*Responses to Treatment of Twenty-Two Patients with Pulmonary Fibrosis*

Degree	No. of Patients	Clinical Response: Deaths	Worse	Same	Slightly Better	Moderately Better	Much Better	"Cured"
Slight	4	..	..	..	2	1	1	..
Moderate	12	..	..	1	2	7	2	..
Advanced	5	1	..	..	2	2	..	..
Far advanced	1	1	..	..	..	..	..	..
Total	22	9% (2)	.....	4% (1)	27% (6)	45% (10)	13.7% (3)	0

Measurements (10 Patients)

	Vital Capacity	Change	Maximal Breathing Capacity (Liters per Minute)	Change
Before	1,950 cc.	.....	26	.....
After one treatment	2,415 cc.	+23%	34	+30%
After course	2,560 cc.	+31%	45	+73%

TABLE 8.—*Responses to Treatment of Thirteen Patients with Cor Pulmonale*

Degree	No. of Patients	Clinical Response: Deaths	Worse	Same	Slightly Better	Moderately Better	Much Better	"Cured"
All patients were too ill to have measurements done before treatment	13	15% (2)	0	8% (1)	15% (2)	31% (4)	31% (4)	0

6. Comroe, J. H., Jr.; Bahnson, E. R., and Coates, E. O., Jr.: Mental Changes Occurring in Chronically Anoxemic Patients During Oxygen Therapy, J. A. M. A. **143**: 1044 (July 22) 1950.

better bronchial drainage and expectoration of sputum. Many patients have indicated that it was far superior to postural drainage in facilitating the "raising" of sputum and gave them the first real relief they had experienced in many years of this chronic disease. Antibiotic aerosols are also useful when acute respiratory exacerbations supervene. The treatment of the emphysema that always complicates extensive bronchiectasis also contributes to the improvement of these patients.

In the treatment of bronchial asthma we have found that pressure breathing should be used chiefly as an adjunctive method of therapy. It is a more effective way of administering aerosol bronchodilators. We have found it helpful in the treatment of status asthmaticus, but it does not supplant intravenously administered fluids, iodides, epinephrine, or cortisone.

In patients with pneumonoconiosis and pulmonary fibrosis the clinical and spirometric improvement have often been striking, particularly if extensive bullous emphysema has not yet developed as a complication.

In the management of cor pulmonale this therapy has seemed more helpful than any other mode of treatment with the possible exception of phlebotomy. In addition to using pressure breathing we have found it important to look for possible intercurrent pulmonary infections as a precipitating cause of acute failure of the right side of the heart. These infections are often subclinical and not easily recognizable on either roentgenograms or physical examination. The early and judicious use of antibiotics, both parenterally and as aerosols, may be extremely valuable in the treatment of this serious cardiac complication. In conclusion, intermittent positive pressure breathing has proved to be a valuable method of treating the emphysema that so frequently complicates a large number of chronic pulmonary diseases.

SUMMARY

The results of treating 200 consecutive patients with chronic pulmonary disease (emphysema, bronchiectasis, asthma, etc.) with a technique of intermittent positive pressure is described in detail. Of the total number of patients, 5.5% died; 1.5% became worse; 11% remained the same; and 82% improved. The possible mechanisms involved in this therapy are discussed.

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PUBLIC HEALTH ASPECTS OF A SPEECH AND HEARING PROGRAM

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It is frequently emphasized that the profession of public health was the result of the efforts of private medical practitioners to perform what seemed to them to be their civic duty. Certainly this has been true in Tennessee, for the Tennessee State Medical Association in 1877 sponsored legislation that established the Tennessee Department of Public Health.[1] It has been my observation that each new responsibility given to the department of public health has come either directly from organized medicine or from society, wherein the medical profession has acted in the capacity of counselor and spokesman. An outstanding example of this has been the recent development of a coordinated state-wide public health program, the purpose of which is to find, treat, and rehabilitate persons, especially children, handicapped by defects of speech and/or hearing. When one considers the importance of speaking and hearing in successful interpersonal relations, it is not surprising that disrupted communication exerts a malicious influence on all facets of developing personality. To find and treat these defects early is to enhance the person's school progress, social adjustment, and economic achievement.[2] This presentation is made, therefore, to describe the development of a state-wide program in speech and hearing, to define the magnitude of the problem in the population,[3] to evaluate different methods of case finding, and to describe the responsibility and leadership that a public health agency can assume in this field.

Undoubtedly, the most significant development in speech and hearing in Tennessee was the organization of the Tennessee Hearing and Speech Foundation in 1949. This foundation, a nonprofit organization, chartered under the laws of Tennessee and led by a forward-thinking otolaryngologist who had long appreciated the magnitude and seriousness of the problem, is a cooperative enterprise sponsored initially by the Tennessee State Medical Association and now supported by more than 40 public and private agencies and organizations.[4] The foundation encompasses the entire state in its organization, with six speech and hearing clinical centers already operating under it or in process of organization, these being strategically located so as to be accessible to all geographic areas of Tennessee. The Tennessee State Medical Association supporting the Tennessee Hearing and Speech Foundation sponsored two legislative acts in the 1951 Tennessee general assembly, one of which redefined legally a crippled child and included speech and hearing defects as handicapping; the other appropriated to the Crippled Children's Service, Tennessee Department of Public Health, $120,000 annually and charged the department with development and operation of a state-wide program.

The over-all problem is being approached in three phases. The Tennessee Department of Public Health has full responsibility for the first phase, case finding, which

From the Division of Maternal and Child Health Services, Tennessee Department of Public Health.

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1. Foote, R. M., and Hutcheson, R. H.: Private Medicine and Public Health Meet a Challenge: Tennessee's Program for the Speech and Hearing Handicapped, J. Tennessee M. A. **44**: 352-354 (Aug.) 1951.

2. Mann, O., and others: Report of Commission on Children, Nashville, Tenn., State of Tennessee, December, 1950.

3. Lesser, A. J.: Services for the Child Who Is Hard of Hearing, Children's Bureau Publication 334, Federal Security Agency, Social Security Administration.

4. McConnell, F., and Wilkerson, W. W., Jr.: A Hearing and Speech Center Is Organized, J. Tennessee M. A. **44**: 395-398 (Sept.) 1951.

is being accomplished through highly qualified speech and hearing field consultants testing children in all areas of the state. Referrals from private physicians are also received and processed. The second phase is concerned with indicated and necessary medical care and includes also the specialized services provided by speech and hearing clinics under the Tennessee Hearing and Speech Foundation, with the cooperation of the Tennessee Department of Public Health. Prior to admission to speech and hearing clinical centers all persons must have general medical and otolaryngological examination and treatment if indicated.[5] Children from medically indigent families are provided all services in the second phase by Crippled Children's Service, Tennessee Department of Public Health. The third phase is concerned with education and is the assigned responsibility of the state department of education, which provides local speech and hearing teachers, establishes special instructional programs, and provides special classes where indicated. The intimate coordination of this three phase program has made an extensive service and training program possible[6] (fig. 1).

case finding method has been to furnish regular teachers with a symptom sheet on which are indicated symptoms and signs that might point to a hearing loss or a speech deviation. Using these sheets as a guide, the teacher refers all children whom she suspects. These are then screened by the public health department consultants. By this method and including in excess of 46,000 children 2.7% of children were found to have speech defects and 2.1% of children were found to have hearing defects. A third case finding method has been to merely ask regular schoolteachers to refer for testing any children whom they suspect of having either a speech or hearing defect. These referrals were then screened and retested by public health department consultants. By this method 2.7% of children were found to have speech defects and 1.8% of children were found to have hearing defects. Considering only major defects, using the criteria outlined above, by mass survey there were 1.5% of children found to have major speech defects and 3.3% of children found to have major hearing defects. By case finding methods utilizing the symptom sheet, 1.0% of children were found to have major speech defects and 1.1% of children found to have major hearing defects. By teacher referral without preparation or guidance, 0.5% of children were found to have major speech defects and 0.9% of children found to have major hearing defects.

TABLE 1.—*Defects Among Elementary School Children, According to Method of Case Findings in Nineteen Counties in Tennessee, 1951-1952*

Method of Case Finding	Elementary School Enrollment	Total Defects				Major Defects			
		Speech		Hearing		Speech		Hearing	
		No.	%	No.	%	No.	%	No.	%
Mass survey	13,010	1,163	8.9	1,790	13.8	192	1.5	430	3.3
Referral by teachers using symptom sheets	46,188	1,244	2.7	980	2.1	447	1.0	494	1.1
Referral by teachers without preparation	4,505	120	2.7	79	1.8	21	0.5	41	0.9

Criteria for determining the existence of a defect are as follows: A noticeable speech defect is considered minor if it is without observable implications of maladjustment; it is considered major if it calls attention to itself and interferes with adequate communication or may be causing maladjustments of the person. In determining hearing defects, all children are screened individually at 15 db. in frequencies 250 to 8,000 cps. Those failing this screening are retested to determine the extent of the defect; they are classified then as minor if this loss does not interfere with perception of communication and if there is no evidence of potentially progressive disease and major if hearing is impaired below 15 db. in any frequency between 250 and 8,000 cps and/or if there is history or evidence of a chronic pathological condition.

An appreciation of the magnitude of the problem has been gained through case finding surveys in 19 counties of Tennessee among elementary school children, three different case finding methods being used. The results are given in table 1. The percentages, with respect to hearing, do not differ greatly from the findings of a comparable survey in Harford County, Maryland.[7] The first method, a mass survey made in six counties by public health department speech and hearing consultants, testing approximately 15,000 children, revealed 8.9% of children with speech defects and 13.8% of children with hearing defects. In all 22.7% had either a speech or hearing defect requiring observation, special education, or medical or clinical treatment. A second

Comparison of these various methods of case finding has revealed mass survey of all children by public health department consultants to be the most effective in both speech and hearing. In the case of major speech defects, referral by a teacher using the symptom sheet was rather effective, but such was not true in any other case. It seems valid to assume that only through complete mass survey made by public health department consultants will the true magnitude of the problem be discovered and that by other case finding methods many children who are defective are not being recognized.

Table 2 and figure 2 show the relation of speech and hearing defects to age based on mass survey only. It is important to point out that total speech defects, high in the early school age groups, tend to diminish slowly as age increases. Early treatment of these would certainly hasten the fall of this diminishing curve, so that speech defects would not carry over into the upper elementary

5. Speech Problems of Children: A Guide to Care and Correction, Johnson, W., editor, New York, Grune & Stratton, Inc., 1950.

6. Newhart, H., and Roger, S. H.: Syllabus of Audiometric Procedures in the Administration of a Program for the Conservation of Hearing of School Children, Tr. Am. Acad. Ophth. (supp.) pp. 1-28, April, 1945.

7. Hayman, C. R.; Rich, B. S., and Stark, E.: Conservation of Hearing Program for School Children: Review of 3 Years Experience in Harford County, Maryland, Am. J. Pub. Health **41**: 1509-1520 (Dec.) 1951.

grades. It would be expected that this treatment would also improve the school adjustment and the academic progress of these children. Major speech disorders, however, remain fairly constant, indicating that certainly the major speech defect needs aggressive attention. Contrastingly, total hearing defects tend to increase with age, as

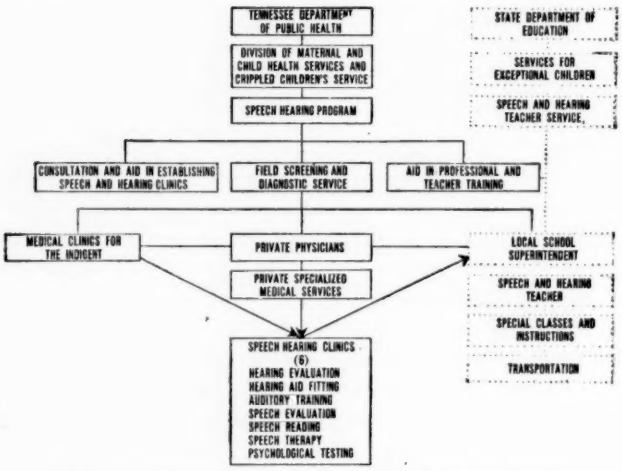

Fig. 1.—Organization chart of the speech and hearing program.

do major hearing defects. This would seem to support the contention that it is important to find hearing defects early and treat them well, and further, that lack of care in early age compounds the problem as time progresses.

Table 3 presents the findings of the mass surveys with respect to sex. The findings in Tennessee are no different from those reported elsewhere, in that defects are more frequently found in boys than in girls.

The contributions that public health agencies can make in programs of this nature are many and valuable. The presence of speech and hearing defects appears to be universal and too great for uncoordinated efforts to be effective. Through public health programs it may be possible to determine causes of speech and hearing defects,

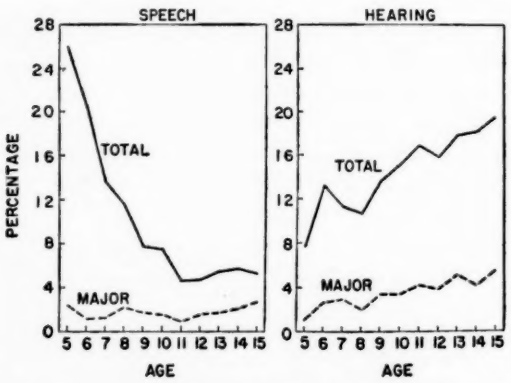

Fig. 2.—Percentage of elementary school children examined in a mass survey in six counties of Tennessee with speech and hearing defects, by age, from 1951 to 1952.

especially in the younger age groups, and thereupon methods of prevention can be developed. It is now an accepted public health responsibility to insure necessary services, whatever they may be, to the end that no child will be hampered in his receipt of a normal education leading to eventual self-support and responsible citizenship. Public health programs can provide case finding services to all economic components of our population, can refer to private physicians those cases able to afford indicated treatment, and can provide necessary services for those children whose families cannot afford private medical care. Public health agencies can also support private movements in the field of speech and hearing rehabilitation and can stimulate interest widely toward development of additional needed services. Further, public health agencies are accustomed to working with the medical profession and are adept at utilizing local community resources. Thereby, they can develop programs

TABLE 2.—*Number and Percentage of Children Found to Have Defects, Examined in a Mass Survey in Six Counties of Tennessee, by Age, 1951-1952*

Children Examined		Children with Defects				Children with Major Defects			
		Speech		Hearing		Speech		Hearing	
Age	No.	No.	%	No.	%	No.	%	No.	%
Total	12,360	1,163	9.4	1,790	14.5	192	1.6	430	3.5
5	208	54	26.0	16	7.7	5	2.4	2	1.0
6	1,313	271	20.6	173	13.2	15	1.1	34	2.6
7	1,421	193	13.6	160	11.3	18	1.3	41	2.9
8	1,533	177	11.5	163	10.6	32	2.1	30	2.0
9	1,430	110	7.7	195	13.6	25	1.7	48	3.4
10	1,423	106	7.4	215	15.1	21	1.5	49	3.4
11	1,344	62	4.6	227	16.9	12	0.9	56	4.2
12	1,335	63	4.7	211	15.8	20	1.5	52	3.9
13	1,216	66	5.4	216	17.8	20	1.6	62	5.1
14	612	34	5.6	111	18.1	12	2.0	26	4.2
15	328	17	5.2	64	19.5	9	2.7	18	5.5
16	125	7	5.6	31	24.8	3	2.4	9	7.2
17	15	...	....	5	33.3	..	...	3	20.0
18	2	...	....	...	....	..	...	..	...
19	.....	...	....	...	....	..	...	..	...
20	.....	...	....	...	....	..	...	..	...
21	1	...	....	...	....	..	...	..	...
Unknown	54	3	5.6	3	5.6	..	...	..	...

TABLE 3.—*Number and Percentage of Children Found to Have Defects, Examined in a Mass Survey in Six Counties of Tennessee, by Sex, 1951-1952*

Children Examined		Children with Defects				Children with Major Defects			
		Speech		Hearing		Speech		Hearing	
Sex	No.	No.	%	No.	%	No.	%	No.	%
Total	12,360	1,163	9.4	1,790	14.5	192	1.6	430	3.5
Boys	6,421	699	10.9	1,133	17.6	132	2.1	263	4.1
Girls	5,939	464	7.8	657	11.1	60	1.0	267	2.8

broad in scope that will insure that all medical and clinical services are available and that rehabilitation of the person is completely satisfactory.

418 Sixth Ave., N.

Childhood Accidents.—Accidents are the leading cause of death in the child from one to 14 years of age. Accidents cause almost as many deaths in this age group as all diseases combined. The prevention of death from accidents is the greatest challenge to the practicing physician today. The degree of our success in an accident prevention program will largely determine whether the death rate among children continues to fall as it has during the past half century. We must stop considering accidents as an act of God and realize that accidents are either an act or negligence of man. The percentage decrease in death rates from accidents has lagged far behind those from diseases in the age group one to 14 years.—Howard J. Morrison, M.D., *Childhood Accidents and Their Prevention, Journal of the Medical Association of Georgia*, September, 1952.

FEMORAL AND ILIAC ARTERY EMBOLECTOMY

CRITICAL REVIEW OF CASES AT COOK COUNTY HOSPITAL FROM 1946 TO 1951

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Since Labey [1] (1911) and Key [2] (1912) established embolectomy as a surgical procedure, occasional reports on the results of treatment of peripheral arterial embolism have appeared in the literature; in general these have favored surgical over nonsurgical treatment. However, in any hospital embolectomy is an uncommon procedure, and the reports of small series of cases, involving a particular artery, are difficult to evaluate because of the many variable factors that affect the immediate and final results. Recently we observed several cases of unexpected failure of femoral artery embolectomy despite immediate good results following removal of the embolus, and it was decided to review and analyze critically all cases of embolectomy at the Cook County Hospital within the previous five years. The purpose of this report is to present the end results of femoral and iliac artery embolectomies obtained at Cook County Hospital, and to compare the results with those reported from other institutions.

MATERIAL

During the five year period studied, femoral or iliac artery embolectomy has been performed on 19 patients at Cook County Hospital. This site of embolic occlusion was chosen because it provided the largest series of cases of involvement of a particular artery. The responsible attending surgeon supervised the over-all plan of therapy when the surgery was performed by senior members of the house staff during their last few months of residency. Usually good immediate results were observed, and patients had long periods of follow-up care in the hospital whenever necessary.

The patients selected for embolectomy usually showed the classical picture, characterized by the so-called three "P's" of pain, pallor, and paralysis of the involved extremity. The onset of symptoms was sudden and severe in 17 patients and gradual in 2. The ages varied from 31 to 85 years; 8 of the 19 patients were over 60 years old (table 1). Sixteen patients had preexisting heart disease, and 10 had auricular fibrillation at the time of admission; hypertension, coronary occlusion, and decompensation were present in five cases; and a silent posterior occlusion was detected by electrocardiography in one patient. The remaining three patients apparently had no heart disease. One patient had a proximal thrombosed aneurysm. Twelve patients were men, and seven were women. Embolectomy was performed within the accepted optimal 8 hours after onset of symptoms on 11 patients, between 8 and 12 hours on 2, between 12 and 24 hours on 3, and after 24 hours on 4.

INDICATIONS FOR EMBOLECTOMY

The diagnosis of peripheral arterial embolism may be difficult, and this condition can be confused with primary thrombosis of the peripheral vessel, with a propagating thrombus superimposed on a small embolus incompletely occluding the vessel, or with arterial spasm secondary to thrombosis or to a small embolus. To confirm the diagnosis the source of the embolus should be looked for. The source is almost always (1) a thrombus in the left auricular appendage due to auricular fibrillation; (2) a mural thrombus in the left ventricle as a result of coronary occlusion and myocardial infarction; or (3) thrombosis of an atherosclerotic and arteriosclerotic plaque or an aneurysm of the abdominal aorta. The clinical history, physical examination, an electrocardiogram, and a roentgenogram of the abdominal aorta will provide information to confirm the source of a peripheral arterial embolus.

The site of occlusion can be localized fairly accurately by examination of the limb. Arteriospasm will increase and extend the circulatory deficiency to a higher level than the site of the embolic occlusion. Vasodilator drugs or sympathetic blocks are effective in removing the vasoconstrictor factor, but their use should not delay surgery beyond the optimal eight hour limit. Oscillometric and skin temperature readings should be made, if possible. Palpation of the aortic, iliac, and femoral pulsations will help in localizing the arterial obstruction. As a general rule, the embolus is arrested at a bifurcating artery above the level of sensory, motor, and temperature changes.

TABLE 1.—*Age of Patients and End Results of Femoral and Iliac Artery Embolectomy*

No. of Patients	Age, Yr.	Results		
		Success	Amputation	Death
3	30-40	1	..	2
5	40-50	..	2	3
3	50-60	..	..	3
5	60-70	..	2	3
1	70-80	..	..	1
2	80-90	..	1	1

The optimal conditions for favorable results of peripheral arterial embolectomy are: (1) duration of the occlusion less than eight hours; (2) site of obstruction at the bifurcation of a large vessel; (3) normal arterial wall at site of embolus; (4) absence of multiple emboli; (5) absence of rapid clotting tendency of the blood that will contribute to secondary or propagating thrombosis; and (6) youth of the patients, particularly those with auricular fibrillation. The operation is less likely to be successful in elderly patients with severe coronary disease. Embolectomy is rarely necessary in the arm, and is more frequently unsuccessful in the smaller arteries because of subsequent thrombosis at the site of narrowing of the sutured arteriotomy incision.

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1. Labey, M. G.: cited by Mosny, M., and Dumont, N. J.: Femoral Embolus in Uncomplicated Mitral Stenosis: Embolectomy and Recovery, Bull. acad. de méd., Paris **66**: 358-361, 1911.

2. Key, E.: Embolectomy in the Treatment of Circulatory Disturbances of the Extremities, Surg., Gynec. & Obst. **36**: 309-316, 1923.

TECHNIQUE OF EMBOLECTOMY

Anesthesia is usually induced by local infiltration and field block with 0.5% procaine solution. Epinephrine is not used because most patients have cardiac disease, and many receive digitalis. Spinal anesthesia is contraindicated because of the frequent depressant effect on the blood pressure.

When the embolus is in the lower extremity, the abdomen, groin, and popliteal area are prepared for possible surgical incisions. Exposure of the entire iliac artery is obtained through a long oblique muscle-splitting incision in the lower abdominal quadrant. After the fibers of the obliquus internus and transversus abdominis are separated medially, the incision is extended inferiorly along the linea semilunaris to permit a wide lateral retraction of the muscle flap. The peritoneum is pushed medially to expose the iliac vessels. For femoral artery exposure a long vertical incision is made along the course of the vessel; the profunda femoris artery is located about three fingerbreadths below the inguinal ligament. In the popliteal space a transverse incision will give good exposure of the popliteal artery and is less likely to cause contracture than a vertical incision.

After exposure of the arresting arterial bifurcation, loops of soft rubber tubing are placed proximal and distal to the site of incision to control the vessel. Usually a distal portion of the embolus can be dislodged proximally without difficulty. The larger, more proximal artery above the bifurcation (figure) is used for incision and suture because thrombosis at the suture site occurs more frequently in the smaller arteries.

TABLE 2.—*Duration of Symptoms at Time of Embolectomy and End Results*

Duration	Results: Success	Amputation	Death	Total
Under 8 hr.....	1	2	9 *	11
8 to 12 hr.....	0	1	2 †	2
12 to 24 hr.....	0	2	1 ‡	3
Over 24 hr.....	0	0	3 §	3

* Four deaths were due to cardiac failure, four deaths were due to further emboli, and one postamputation cardiac failure occurred seven days after operation.
† One postembolectomy death and one postamputation death were due to cardiac failure.
‡ One postembolectomy death was due to cardiac failure.
§ Two deaths were due to further emboli, and one was due to infection.

In some cases a distal thrombus is found that cannot be removed by gentle suction through the arteriotomy. This is recognized after removal of the embolus by the absence of retrograde blood flow through the collateral channels (Coenen and Henle sign).[3] In such cases retrograde irrigation with isotonic sodium chloride solution is made through a distal artery. This involves an additional risk of thrombosis. Heparin solution is used to irrigate the artery and site of arteriotomy.[4] All instruments and catheters used to contact the intima are lubricated with mineral oil. The wall of the vessel is closed with a one layer running suture of well-lubricated no. 6-0 silk on an atraumatic needle.

Spasm of the artery is relieved by procaine infiltration of the arterial wall and postoperative lumbar blocks. These blocks are continued only while heparin is being given and until the prothrombin level is depressed with bishydroxycoumarin (dicumarol®). After this time lumbar blocks are dangerous and should not be used. One of us (F. V. T.)[5] reported a fatality from a concealed hemorrhage following lumbar block during effective bishydroxycoumarin therapy.

RESULTS OF EMBOLECTOMY

In the series of 19 femoral or iliac embolectomies performed during a five year period at the Cook County Hospital, only one patient was discharged with a surviving embolectomized leg,[5] 15 died in the hospital, and 3 were discharged with an above-the-knee amputation (table 2). Removal of the embolus with restoration of the blood flow and immediate relief from symptoms should not be considered adequate criteria for success of the surgical procedure. The single successful embolectomy was done by one of us (W. K.) after the material for this paper had been collected and definite ideas as to indications and technique had been established. The patient [6] was a young man with rheumatic valvular disease and auricular fibrillation.

Diagrammatic illustration of a major artery at its bifurcation, showing location of the arteriotomy incision above the bifurcation. Thrombosis at the arteriotomy site is less likely to occur in the larger vessel.

COMMENT

The results of treatment of peripheral embolism reported in the literature almost entirely favor the surgical procedure rather than nonsurgical methods. Key,[2] in 1923, reported 10 cases of his own of embolectomy, with gangrene in four. By 1934,[7] he had collected 208 cases of femoral embolectomy in Sweden, with restored circulation in only 20.7% and amputation in 15.4%. The eventual hospital mortality was 63.9% in this series. Pearse [8] (1933), after reviewing 296 reported cases of embolectomy, concluded that good results from embolectomy of the common iliac artery were obtained in 42%, if the operation had been done within 10 hours. Danzis [9] (1933), after a review of 129 cases from the world literature, concluded that restoration of circulation is obtained in one-third of the patients who have embolectomies in the leg, if the operations are performed early. Lund [10] (1937) had a mortality rate of 45% in 20 femoral embolectomies. Linton [11] (1937) reported

3. Henle-Coenen sign, cited by Matas, R.: Testing the Efficiency of the Collateral Circulation as a Preliminary to the Occlusion of the Great Surgical Arteries, J. A. M. A. **63**: 1441-1447 (Oct. 24) 1914.

4. Donovan, T. J.: The Uses of Plastic Tubes in the Reparative Surgery of Battle Injuries to Arteries with or Without Intra-arterial Heparin Administration, Ann. Surg. **130**: 1024-1043, 1949.

5. O'Connor, W. R.; Preston, F. W., and Theis, F. V.: Retroperitoneal Hemorrhage Following Lumbar Sympathetic Block During Treatment with Dicumarol: Report of Fatality, Ann. Surg. **131**: 575-580, 1950.

6. Klingensmith, W., and Theis, F. V.: Arterial Embolectomy: Factors Considered in the Selection of Patients for Operation with Case Report, to be published.

7. Key, E.: Embolism of the Peripheral Arteries, Brit. J. Surg. **24**: 350-361, 1936.

8. Pearse, H. E., Jr.: Embolectomy for Arterial Embolism of the Extremities, Ann. Surg. **98**: 17-32, 1933.

9. Danzis, M.: Arterial Embolectomy, Ann. Surg. **98**: 249-272, 422-437, 1933.

10. Lund, C. C.: The Treatment of Embolism of the Greater Arteries, Ann. Surg. **106**: 880-909, 1937.

11. Linton, R. R.: Acute Peripheral Arterial Occlusion and its Treatment, New England J. Med. **216**: 871-875, 1937.

12. Pratt, G. H.: The Surgical Treatment of Peripheral Embolism, Am. J. Surg. **56**: 566-572, 1942.

13. Dickinson, A. M.: Embolism of the Peripheral Arteries: Report of 6 Cases, Am. J. Surg. **57**: 508-512, 1942.

three successful cases in nine femoral or iliac embolectomies (33%). Pratt [12] (1941) reported operative success in 61.5% of 16 patients observed personally, but he does not state how many died or had amputations. Dickinson [13] (1942) had one success in five leg embolectomies (20%). Lesser [14] (1943) reports four femoral embolectomies, all successful, despite a time interval of 14 hours in one and 13 hours in another. McClure and Harkins [15] (1943) had 3 successes in 10 embolectomies (30%). Warren and Linton [16] (1948) reported 15 femoral embolectomies with survival of 13 legs. Veal and Dugan [17] (1951) were able to restore the circulation of the leg in three cases with iliac embolectomies and in five with femoral embolectomies; all were performed within eight hours of onset. In one instance, thrombosis of the iliac artery followed and amputation was performed. Two other reports on peripheral embolism have come from Cook County Hospital. Koucky, Beck, and Hoffman [18] (1940) reviewed 25 cases and found no surviving patients in the three treated by embolectomy; Reynolds and Jirka [19] (1944) reported 14 satisfactory results in 16 embolectomies.

REASONS FOR FAILURE OF EMBOLECTOMY

Criteria for appraising the results obtained from embolectomy have not been uniform in reports by various surgeons. Operative success is assumed by some if the embolus is removed, without considering the incidence of eventual amputation or hospital mortality. Frequently the results obtained from embolectomy in the arm and leg are considered together despite the fact that gangrene seldom follows occlusion of the axillary or brachial artery.

Embolectomy in the leg may be unsuccessful for the following reasons (table 3):

1. Most patients who have embolic occlusions have severe cardiac disease or other serious conditions. Such patients may die because of other emboli or cardiac failure. Two patients had multiple emboli at autopsy, and in another sudden and complete embolic occlusion of the aorta occurred just before death. In two cases death occurred from heart failure soon after embolectomy. Death from these causes does not detract from the usefulness of embolectomy, but should be considered in appraising final results.

2. An embolus may be removed successfully only to be followed by thrombosis at the arteriotomy site, occlusion of the vessel, and gangrene. Ordinarily heparin and bishydroxycoumarin are of great value in preventing intravascular clotting, but the instances of postoperative thrombosis observed in this series occurred while the patients were receiving effective anticoagulant therapy.

3. The length of time from onset of symptoms to removal of the embolus should not exceed eight hours if good results are to be expected. This rule was not followed in eight of our cases. When a longer time elapses, the embolus becomes adherent to the intima of the vessel, a distal thrombus forms and occludes the peripheral arteries, and irreversible ischemic changes occur in the leg.

4. Advanced age of the patient adds to any surgical risk, but this is especially true in embolectomy because of the arteriosclerotic changes in the arteries. Three of our patients were in the fifth decade, five in the sixth, one in the seventh, and two in the eighth. We feel that failure of embolectomy can be attributed to extreme age in the two patients in the eighth decade of life; collateral circulation is less expansive in this age group, and suturing of an arteriosclerotic artery is seldom successful.

5. Because of the scarcity of suitable cases for embolectomy, no one surgeon has the opportunity to develop a large experience with this procedure. Some unsuccessful results are doubtless due to errors in differentiating embolism from thrombosis and in localizing the embolus, and to incomplete removal of the embolus.

SUMMARY

Nineteen consecutive cases of femoral or iliac embolectomy from Cook County Hospital are reviewed. Only one case did not terminate during the period of hospitalization in amputation or death. These results are compared with those reported in the literature. A suggested technique of embolectomy is outlined; emphasis is placed on opening the artery at or above its bifurcation where the lumen is greatest and the suturing will not seriously narrow the vessel. Reasons for failure of embolectomy are discussed in relation to the 18 cases discussed, including (*a*) fatal cardiac disease; (*b*) subsequent fatal emboli because the source of embolism is still present; (*c*) advanced age of the patient due to the generalized arteriosclerotic process; (*d*) delay of surgical intervention past the optimum time of eight hours, resulting in endothelial damage and secondary thrombosis; (*e*) thrombosis at the arteriotomy site; and (*f*) failure of the surgical procedure to remove the obstruction.

Favorable results of embolectomy reported by other surgeons are in some instances the result of failure to consider eventual mortality or morbidity. The removal of the embolus and immediate restoration of circulation and relief of symptoms are not sufficient criteria for success of the surgical procedure. Grouping arm and leg cases together will also increase the number of good results, since arm emboli rarely cause gangrene.

TABLE 3.—*Causes of Failure of Embolectomy*

Results and Causes		Total
Gangrene and amputation, due to		5
Subsequent thrombosis	2	
Obstruction not removed	3	
Hospital deaths, due to		15 *
Subsequent fatal emboli	6	
Cardiac deaths	8	
Infection	1	

* Includes two cardiac deaths (in patients 82 and 60 years of age) two days and seven days after amputation.

14. Lesser, A.: Embolic Arterial Occlusion of Lower Extremities: With Report of 4 Successful Embolectomies and Review of the Literature, J. A. M. A. **122**: 285-289 (May 29) 1943.

15. McClure, R. D., and Harkins, H. N.: Recent Advances in the Treatment of Peripheral Arterial Embolism, Surgery **14**: 747-797, 1943.

16. Warren, R., and Linton, R. R.: The Treatment of Arterial Embolism, New England J. Med. **238**: 421-429, 1948.

17. Veal, J. R., and Dugan, T. J.: Peripheral Arterial Embolism, Ann. Surg. **133**: 603-610, 1951.

18. Koucky, J. J.; Beck, W. C., and Hoffman, J. M.: Peripheral Arterial Embolism, Am. J. Surg. **50**: 39-49, 1940.

19. Reynolds, J. T., and Jirka, F. J.: Embolic Occlusion of Major Arteries, Surgery **16**: 485-518, 1944.

CONCLUSION

The end results in 19 cases of femoral and iliac embolectomy have been disappointing. In selected cases extremities can be saved, but, when the operation is performed on patients of advanced age with arteriosclerotic changes in the arteries or after the optimum time for embolectomy has elapsed, the results will be poor. A high hospital mortality rate can be expected because of the serious cardiac condition of most patients with femoral or iliac embolism and because the source of further emboli may still be present.

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ORTHOPEDIC SURGERY IN CEREBRAL PALSY

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The results of orthopedic surgery in cerebral palsy mainly depend on the selection of patients and of surgical procedures and on preoperative and postoperative care. Proper evaluation of indications and contraindications and a correct choice of the surgical measures to be employed are as important as skillful technical performance of the operation. Preoperative measures that permit a successful result and postoperative measures that retain and enhance the benefits of surgery are also essential if maximal benefit is to be obtained from the operative work.

INDICATIONS AND CONTRAINDICATIONS FOR SURGERY

Children with cerebral palsy generally have a specific type of muscle abnormality. The great majority are either spastic or athetoid patients, although the two forms coexist in approximately 15 to 20% of cases. The following principles may be applied in the orthopedic management of both spastic and athetoid patients. 1. Careful evaluation of the type of cerebral palsy, the associated defects, and the cause of delayed or abnormal function of the extremities must precede any surgical therapy. 2. Surgery is not a substitute for muscle re-education and training but merely an adjuvant measure to such therapy and perhaps less important to rehabilitation than physical therapy and bracing. Stabilizing operations such as arthrodesis of joints produce desired results more rapidly with proper aftercare. Muscle transplants, neurectomies, tendon lengthening, and capsulotomies will usually be unsuccessful without adequate postoperative therapy. 3. Cerebral palsy patients, especially growing children, should not be operated on if the same results can be obtained by simple bracing and physical therapy. Most spastic heel cords with equinus deformities can be overcome by stretching, by exercises to strengthen ankle dorsiflexors, and by the use of adjustable short leg braces. Surgery of nerves or muscles usually causes some permanent muscle weakness, which may be avoided by conservative therapy. 4. Deformities in growing children, whether they are caused by spasms or contractures, should not be operated on unless braces are applied postoperatively in order to prevent recurrence of the deformity. This is especially true for ankle equinus, knee flexion, and hip adduction deformities. 5. The pathogenesis or mechanism of the deformity must be known before surgery to determine (*a*) whether the deformity is caused by muscle imbalance or by fixed contracture of the periarticular structures (in severe cases a general anesthesia may be required to differentiate between the two); (*b*) the severity of the spasm in the dominant group of muscles, and the functional status of their antagonists, if the deformity is due to muscle imbalance without contractures. 6. Surgery must be directed against the primary deforming factors and not the secondary or compensatory deformities. If a child has a knee joint flexion contracture a secondary hip flexion contracture will frequently develop. Surgical correction of the hip deformity will not be beneficial and the deformity will recur rapidly unless the knee flexion contracture is operated on previously or concomitantly. 7. Surgical procedures that overcome deformity or diminish spasticity are contraindicated if they retard or impair functional ability. For example, consider a scissors gait in which there is weakness or paralysis of the hip abductors and spasticity of the hip adductors and the child walks by bracing one thigh and knee against the other. Obturator neurectomies will lessen the spasticity and improve the position of the thighs while the patient is reclining, but standing and walking may no longer be possible, because his one means of obtaining balance and support has been eliminated. 8. Contractures due to postural effects should not be corrected surgically unless the patient will be able to use the extremities in the corrected position following the operation. If, for example, a patient has never walked and has acquired hamstring contractures because of sitting in a wheelchair all his life, there is no reason to operate unless he can be taught to walk after surgery. If he returns to a wheelchair existence, the contractures will certainly recur, and the surgery will have produced nothing but surgical scars, and psychic trauma. 9. Whenever possible, an attempt should be made to evaluate the results that are expected to follow surgery. Before doing a wrist fusion, a brace or cast should be applied to maintain the wrist in neutral or cockup position with some ulnar deviation. If finger function is impaired with the wrist so maintained, a wrist fusion is not indicated; however, a period of intensive stretching of the finger flexor tendons may alter these findings and permit the performance of the wrist fusion. 10. Surgical procedures can often benefit the athetoid as well as the spastic patient.

SURGICAL PROCEDURES

In the past, the spastic child has frequently been treated by surgical measures. The athetoid patient with extraneous involuntary movements, dystonic attitudes,

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From the Michael Reese Hospital.

Read in the Symposium on Cerebral Palsy with Patient Demonstration before the Section on Physical Medicine and Rehabilitation at the 101st Annual Session of the American Medical Association, June 11, 1952.

and poor balance has received little, if any, operative consideration. Much of this attitude regarding athetoid patients is caused by the concept of the so-called athetoid shift, a tendency for athetoid movements to shift to an adjacent joint after a surgical procedure designed to eliminate a marked degree of such movements at a specific joint. As a general rule, however, if such shift does occur the athetoid movements at the new site are weaker and less harmful from a functional and cosmetic standpoint. Immobilization of a joint by a cast or brace may be used as a therapeutic test in an attempt to elicit a shift of athetoid motions and to predict the results of surgical procedures.

The commonest deformities of the lower extremities are hip adduction, knee flexion, and ankle equinus. Adduction deformities at the hips may be caused by (1) spastic adductors with nonfunctional abductors, (2) spastic adductors with stretched and weakened but functional abductors, (3) spastic internal rotators, and the (4) gracilis muscle spasm. The deformity may be a fixed contracture or it may be overcome on table examination by simply stretching the spastic adductors. If a contracture exists, adductor tenotomies are required and obturator neurectomies may be necessary. If a muscle imbalance without contracture exists, neurectomies will be sufficient. The anterior obturator branch, the posterior obturator branch, or both may be severed, depending on the degree of spasticity.

The function of the gluteus medius muscle must be determined preoperatively in cases of adduction deformities at the hip joints. This may be extremely difficult if contractures exist. In the absence of contractures, repeated testing of the muscle, after application of braces to prevent its stretching or after obturator nerve blocks to diminish adduction spasm, may elicit voluntary power that was not previously obtainable.

If a child with spastic adductors can walk with his knees and thigh together and if in this child no response can be elicited in the hip abductors, surgery is contraindicated. Neurectomies in this child may do more harm than good. It is better that a patient walk with a scissors or adduction type of gait than not walk at all.

If the adduction deformity is due to spastic internal rotators, it is combined with an internal rotation deformity. In such cases surgery must be directed against the internal rotators, rather than against the adductors. Femoral osteotomy may also be indicated.

One of the most frequently overlooked and most serious complications of cerebral palsy is an acquired type of progressive subluxation and dislocation at the hip joint. It occurs more frequently in spastic than in athetoid, may be present at 2 to 3 years of age in severe cases, and is usually associated with an adduction contracture or severe adduction attitude of the thigh. Unilateral involvement is commoner, and in bilateral involvement the process is usually severer in one hip joint. The diagnosis is usually made after a severe stage of subluxation or complete dislocation has occurred. When a cerebral palsied child has a marked adduction deformity at one or both hip joints, routine pelvic roentgenograms should be taken at the time of the initial examination and at frequent intervals thereafter in order to detect the earliest stages of hip subluxation.

After dislocation of the hip joint has occurred, rehabilitative measures are usually of little help. Treatment should be primarily prophylactic, aimed at prevention of the progressive subluxation. Depending on the mechanism of the hip derangement, as determined by the physical examination and roentgenographic findings, obturator neurectomies, adductor tenotomies, or gracilis tenotomies may be indicated together with postoperative bracing and physical therapy.

Ankle equinus may be caused by muscle imbalance between the plantar flexors and the dorsiflexors or it may have progressed to a fixed deformity with contractures of the muscles, tendons, and capsule of the joint. After studying the mechanism of the deformity, Achilles tendon lengthening, gastrocnemius fascial release, or selective neurectomies of the branches of the posterior tibial nerve may be deemed necessary. It is advisable to do either neurectomies or tenotomies rather than both at the same time to overcome the equinus. It is wiser to do too little and do further surgery at a later date than to do too much surgery and convert an equinus deformity into a calcaneus deformity. If the ankle equinus is so severe that surgery is required, then postoperative bracing is also indicated, especially in growing children.

If a knee flexion contracture exists in either a spastic or an athetoid patient, and if it cannot be overcome by special bracing (dials or springs) combined with intensive stretching, lengthening of the hamstring tendons and a posterior capsulotomy should be done. In knee flexion contractures, stretching exercises without braces are useless, and surgery without postoperative bracing is equally futile.

If the knee can be fully extended but assumes the flexion attitude when it bears weight, the cause of the flexion attitude should be determined by careful examination. It may be caused by weakness of the knee extensor mechanism. More often, however, it is secondary to flexion deformity of the hip or equinus deformity at the ankle, with weakness of the hip extensors or spasm of the gastrocnemius. In a few cases we have observed good results following transplantation or imbrication of the stretched patellar tendon. In many more cases it produced no beneficial results. Proper bracing, crutches, and muscle re-education can be of greater value in knee flexion deformities than surgical procedures.

Arthrodesing operations can be used on both spastic and athetoid patients with equally good results. Subastragaloid fusions to overcome inversion and eversion deformities of the feet, and wrist fusions to improve the appearance and function of the volar flexed hand, are frequently employed with excellent results. With the exception of the wrist fusion the results of operations on upper extremities are extremely poor. Improvements are usually cosmetic rather than functional. Among the operations that may be of value in upper extremity surgery, especially in spastics, are (1) bone block, arthrodesis, and tenodesis operations to overcome thumb adduction, (2) median and ulnar nerve branch neurectomies for pronation and wrist flexion deformities without contractures, and (3) transference of the pronator teres muscle into the extensor carpi radialis longus and brevis to release the spastic pronator and utilize its power to dorsiflex the wrist.

NERVE CRUSHING PROCEDURES

A peripheral nerve resection, such as an obturator, sciatic, posterior tibial, or median nerve neurectomy, may result in a diminished amount of spasticity with cosmetic improvement, but the functional result may be poor because of the muscle weakness produced. Inasmuch as these procedures produce irreversible changes, they may cause serious and permanent functional damage.

After observing the results of phrenic nerve crushing for diaphragmatic paralysis, it was decided to apply the same technique to peripheral nerves in order to obtain temporary paralysis or paresis in spastic muscles of the extremities. During the past year, 20 children have been operated on by this method. The obturators and posterior tibial nerves have been crushed in most patients, singly or in combination. Branches of the median and sciatic nerves have been crushed in a few patients. Although the final results cannot be evaluated at this time, the following observations and tentative deductions may be of interest: 1. Peripheral nerves that are crushed instead of cut regenerate and regain their previous function, both motor and sensory. 2. The time interval between nerve crushing and return of previous function depends on the distance from the crushed area to the motor end plates as well as on the technique of crushing. In our obturator nerve crushings an average of six months elapsed before return of the previous degree of spasticity. 3. Nerve crushing may be used as a therapeutic test. If the procedure produces beneficial results, neurectomies may be performed at a later date without fear of harmful results. 4. During the period of temporary paralysis the stretched and weakened antagonist muscles may be strengthened, so that, after return of function in the crushed nerves, they can maintain their increased strength, especially if aided by braces. 5. The procedure is simple. Casts are unnecessary. Hand function or locomotion may be resumed a few days after surgery.

OBTURATOR NERVE BLOCKS

Temporary paralysis in specific muscle groups may also be obtained by procaine (novocain®) hydrochloride nerve blocks. This has been especially useful for the temporary relief of spasm of the hip adductor muscles. By injection in the obturator nerves the examiner may be able to elicit voluntary muscle power in hip abductors which was previously suppressed by the stronger hip adductor muscle spasm. The postoperative results expected to follow obturator neurectomies may also be simulated by obturator nerve blocks in their immediate effect on standing and walking. Frequently, the improvement is dramatic.

CONCLUSIONS

Surgery is only one part of a broad plan of treatment for patients with cerebral palsy; the aim of treatment is to make the patient physically independent and socially competent and acceptable. Although surgery is often required to supplement specific therapies and bracing, it is not to be considered as a substitute for other rehabilitative measures. The value of surgical treatment should be measured not by its aid in overcoming a local deformity or obstruction but by its contribution toward the over-all rehabilitation of the patient. A knowledge of proper indications for surgery and adequate preoperative and postoperative care is as essential for good results as the skillful performance of the surgical procedure.

116 S. Michigan Blvd.

TRANSMISSION OF RADIOIODINE (I^{131}) TO INFANTS THROUGH HUMAN MATERNAL MILK

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We recently observed two infants, breast-fed by mothers who were given diagnostic tracer doses of radioactive iodine (I^{131}), who demonstrated significant thyroid gland concentration of the isotope. The quantity of radioactive iodine in the milk and the quantity taken up by the thyroid gland of these infants suggested an element of danger in the use of radioactive iodine in lactating mothers and warranted a preliminary report of our observations.

A survey of the literature on distribution of radioactive iodine in tissues did not reveal any instance of radioactive iodine activity in the milk of lactating human beings or transmission to the thyroid gland of nursing infants. Such transmission might have been anticipated from the animal experiments of Rugh [1] and Courrier and his co-workers,[2] who demonstrated sizeable uptakes of radioactive iodine by suckling mice and rabbits following intraperitoneal injection of radioactive iodine in nursing mothers, and the writings in which other radioactive isotopes were reported to be transmitted in maternal milk.[3]

The technique of measurement was the routine type used in the Radioiodine Clinic of the John Gaston Hospital and the University of Tennessee for the past several months. A shielded end window type of Geiger-Müller tube was directed anteriorly toward the thyroid gland at a fixed distance of 7 in. (117.78 cm.). All thyroid tissue was included in the geometric limits of the radiation beam.

The recording of the counter was converted to microcuries of radioiodine by standardization with known

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quantities of activity. A wax-sawdust phantom of the neck, with cavities similar in position and shape to the gland, was used for standardization. Known quantities of radioactive iodine were distributed in the cavities of the phantom, and counts per minute were taken with the geometric arrangement of the phantom and the neck of the patient being identical. Instrument response to radioactivity in the phantom was checked frequently. Linearity was found for the range of activities employed.

Radio-assay of the milk was accomplished by preparation of specimens on copper planchets. Approximately 0.2 ml. of the milk was spread uniformly over the surface of a 1 in. (2.54 cm.) planchet. Planchets were placed under an infrared lamp, and the liquid was evaporated to dryness. Planchets were then read on a Geiger-Müller counter that had been calibrated by means of a standard, simulated radioactive iodine source. The usual precautions required in such procedures were carefully observed.

REPORT OF CASES

CASE 1.—A 33-year-old Negro woman was referred to the Radioiodine Clinic for a diagnostic tracer dose of radioactive iodine. The patient was nursing a 4-month-old infant boy. She was given 100 μc of carrier-free radioactive iodine orally after fasting. Twenty-four hours later, thyroid gland uptake was measured in both the baby and the mother and was found to be 5% and 34%, respectively, of the administered dose. Aliquot specimens of milk obtained by manual expression of the mammary glands 24 hours after ingestion of the radioiodine showed an average concentration of 0.002 μc of radioactive iodine per milliliter.

Since this patient was considered for possible radioiodine therapy, uptake of radioactive iodine by her thyroid gland was measured at intervals of 24 hours for a period of several days. Simultaneous Geiger-Müller counts over the thyroid gland of the baby were also made. Results are shown in table 1. Biologic half life in the maternal thyroid gland was about nine days. Uptake in the thyroid gland of the infant was irregular and undoubtedly conditioned by ingestion of radioactive iodine in unequal amounts by feedings in intervals between testings.

CASE 2.—A 22-year-old Negro woman was referred to the Radioiodine Clinic for a diagnostic tracer dose of radioactive iodine. She was nursing a 4-month-old infant girl. One hundred microcuries of radioactive iodine was administered orally in a carrier-free solution on a fasting stomach. Twenty-four hours later, uptake measured 18 μc and 6 μc in the thyroid gland of the mother and baby, respectively. Aliquot specimens of milk obtained by manual expression of the mammary glands showed an average concentration of 0.0013 μc per milliliter.

TABLE 1.—*Thyroid Uptake of Radioiodine by Nursing Infant (Case 1) Following Tracer Dose to Mother*

Days After Tracer Dose (100 μc)	Percentage of Tracer Dose Taken up by Thyroid	
	Mother	Baby
1*	34	5
3	24	2
4	23	3
5	21	4
6	20	5
7	21	3
10	15	2

* Milk specimen taken one day after tracer dose contained 0.002 μc of radioactive iodine per milliliter.

Two months after the first tracer dose, this patient was again referred to the clinic. Recheck uptake studies were requested because symptoms of thyrotoxicosis had persisted. Although tracer studies are not customarily repeated in this laboratory at intervals of less than six months, this case presented an opportunity to investigate further excretion of radioactive iodine in milk and seemed to justify earlier repetition of the procedure. The baby was placed on a formula exclusively. The mother was given 100 μc of radioactive iodine in a carrier-free solution by mouth. Thyroidal uptake and radioactive iodine concentration in the milk were measured over a period of seven days. Results are shown in table 2.

TABLE 2.—*Excretion of Radioiodine in Milk of Lactating Mother Following Tracer Dose of 100 μc*

Time After Tracer Dose		Percentage of Thyroid Uptake	Concentration of Radioactive Iodine in Milk (μc/Ml.)
Days	Hours		
..	3	24	35×10^{-3}
..	6	29	39×10^{-3}
..	9	36	33×10^{-3}
..	12	36	28×10^{-3}
..	24	36	9×10^{-3}
..	32	..	3.3×10^{-3}
2	..	32	0.8×10^{-3}
3	..	29	0.4×10^{-3}
4	..	26	0.1×10^{-3}
5	..	24	0.5×10^{-3}
7	..	20	.....

Maximal concentration of radioactive iodine in the maternal milk, 0.039 μc per milliliter, occurred about 6 hours after ingestion of the tracer dose, while maximal thyroid uptake occurred after about 10 hours. The biologic half life of radioiodine in the thyroid gland was approximately seven days.

Some time prior to the last tracer dose, breast feeding of the baby was supplemented by other sources, and production of milk by the mammary glands decreased markedly. At no time during manual expression of the breasts was more than 50 ml. of milk obtained. After the sixth day of tests, the breasts were dry. It is reasonable to assume, on the basis of mouse transmission experiments,[1] that the increased uptake demonstrated in this patient the second time (36% in comparison to 18% on the first test) was caused by the decreased excretion of radioactive iodine in the milk, allowing more radioactive iodine to be available for thyroid uptake. It is probable that more actively lactating mammary glands would excrete more radioiodine per unit of milk volume than was found in this particular patient.

SUMMARY AND CONCLUSIONS

1. Two cases are discussed that demonstrate the presence of radioactive iodine (I^{131}) in the milk of lactating mothers following oral administration of tracer doses of the isotope.

2. Concentration of radioactive iodine in the maternal milk is sufficiently high to allow a sizeable uptake in the thyroid gland of the baby.

3. Significant uptake of radioactive iodine by the thyroid gland of nursing infants of these mothers was observed.

4. Radioactive iodine diagnostic tracer studies on postpartum women who breast feed their babies may be

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hazardous to the child, and such studies, therefore, should be done cautiously, if at all. In addition, the reliability of the procedure when used as a diagnostic tool in nursing mothers is open to question, because the radioactive iodine may be diverted from the thyroid gland to the milk.

5. Radioactive iodine therapy is contraindicated in lactating women who breast feed their babies, since the thyroid gland of the infant may take up enough radioactive iodine from the milk to depress seriously or ablate functional activity of the gland.

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VISAMMIN AS BRONCHODILATOR

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Visammin (khellin) is a crystalline derivative of the Middle-Eastern plant Ammi visnaga lam; it was identified as a dimethoxy-methyl-furano chromone [1] and was synthesized in 1949.[2] Samaan's [3] pharmacologic studies in the early 1930's indicated that the drug relaxed isolated muscle preparations from the bronchus of the pig and dog by a direct effect on the muscle fibers. Barsoum and associates [4] reported that absorption of visammin from the stomach and small bowel was rapid, with a maximum blood concentration reached within 30 to 60 minutes after oral administration. When the drug was given intramuscularly, there was a rapid increase in the concentration of it in the circulating blood within 15 to 20 minutes; it soon became stabilized at a level similar to that reached after oral administration of the same dose. The destruction and excretion of visammin proceeded slowly, so that repeated doses had a cumulative effect. Since Anrep and his co-workers started working with visammin, the drug has been extensively investigated as a coronary artery dilator. The literature on this subject has been evaluated and reviewed in a recent report by Hultgren, Robertson, and Stevens.[5]

Anrep and his associates [6] were the first to report on the use of visammin for asthma. These workers reported that a single intramuscular injection of 200 to 300 mg. of visammin gave relief from an acute asthmatic attack within 5 to 15 minutes. The duration of relief was variable, ranging from six hours to days. Visammin administered orally, 300 mg. daily, was less effective than the same amount administered intramuscularly.

Of 138 patients ranging in age from 14 to 61 years, 102 (74%) obtained complete relief; 24 (17%) obtained partial relief; and 12 (9%) obtained no relief. These studies did not seem adequately controlled, and the method of evaluation of the drug was not given for most of the patients. In 20 patients, the vital capacity and the maximal rate of expiration during performance of the vital capacity were determined and were reported as showing an improvement that paralleled the clinical improvement in these patients.

In the United States there are only a few reports on the use of visammin for bronchial asthma. Major,[7] in 1949, reported on its use in 12 hospital patients treated with 200 mg. orally twice daily. He observed that all patients experienced marked relief while in the hospital and that toxic symptoms were negligible.

In 1949, Rosenman and his associates [8] studied the effect of visammin on eight patients with chronic cor pulmonale. They reported "distinct improvement in respiratory mechanics, cyanosis, exercise capacity, and dyspnea." They administered 100 to 300 mg. of visammin orally per day. Twenty-one patients with bronchial asthma were treated with single intramuscular injections of 200 mg. of visammin. Nine were reported as showing complete and prompt relief, with moderate relief in three and no relief in nine. The improvement was usually of short duration. Patients experienced a high incidence of unpleasant side reactions, including insomnia, somnolence, dizziness, and urticaria. The incidence of untoward reactions appeared to increase with larger and repeated doses. Of 59 patients, toxic reactions occurred in 17, and administration of the drug had to be discontinued in 10.

Derbes and his associates [9] recently reported a study of 45 clinic patients with bronchial asthma who were treated with visammin. They were given 100 mg. doses orally and intramuscularly. Of 20 patients treated intramuscularly, good or excellent results were experienced by 12 and slight or no benefit by 8. Of 25 patients treated orally, good or excellent results were reported by 14 and slight or no benefit by 11. The over-all incidence of improvement was 60%. Evaluation was by clinical means only.

The visammin used in this study is "eskel" provided by Smith, Kline & French Laboratories in Philadelphia. Dosages are expressed as crystalline khellin.

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9. Derbes, V. J., and others: Observations on the Action of Khellin in Attacks of Bronchial Asthma, Ann. Allergy **9**: 354, 1951.

Silber and his associates [10] reported the effect of visammin on cardiopulmonary function in chronic pulmonary diseases. These studies were carried out by means of combined ventilatory and cardiac catheterization studies. Visammin administered either intramuscularly or, for a period of one week, orally, produced no consistent change in ventilation, oxygen uptake, oxygen removal, cardiac output, or pulmonary arterial pressure during rest and exercise. It did not appear to have any protective effect on arterial oxygen saturation during exercise. These results are in agreement with the cardiac catheterization studies of Hultgren and his co-workers [5] and Cash and Zimmerman.[11] Silber and his associates [10] found an increase in maximum breathing capacity in four patients for whom information was available after visammin was administered orally. Because of this finding and the above reports, a controlled study of the effects of visammin in bronchial asthma was begun.

MATERIAL AND METHODS

The study was carried out in two phases: (1) an investigation of the effects of visammin administered orally over a prolonged period and (2) a study of the immediate effects of visammin given intramuscularly.

Eight patients with asthma of long duration, who were rarely completely symptom-free, were chosen for treatment with visammin administered orally. All were studied by means of histories, physical examinations, skin tests, chest roentgenograms, and, if indicated, electrocardiograms. None of the patients showed evidence of cardiac disease. In five patients, the asthma was both intrinsic and extrinsic in etiology; in three it was purely intrinsic. Six of the subjects were studied as outpatients, two in the hospital. All were known to respond to epinephrine administered subcutaneously (table 1).

At the beginning of the study, the vital capacity and the maximum breathing capacity were measured, and their normal figures were predicted according to the method of Cournand.[12] Determinations were repeated until duplicates agreeing within 10% were obtained and the largest value was reported. Isopropylarterenol (isuprel®) hydrochloride 1:200, 0.3 cc., was administered as an aerosol, and 20 minutes later the determinations were repeated. The air velocity index of Gaensler [13] was calculated.

The patients were then placed on visammin, 40 mg. three times daily, or on an identical placebo tablet. The outpatients received drug or placebo for periods of two weeks each, the hospitalized patients for periods of one week each. All other medication was stopped during the period of study, except 1:1000 epinephrine given subcutaneously as necessary for the control of acute attacks of asthma. The laboratory did not know whether visammin or placebo was being used and did not take part in the clinical evaluation. At regular intervals during the study, the number of acute attacks since the last visit, the number of injections of epinephrine, toxic symptoms, the subjective impressions of the patients, and the physical findings in the chest were recorded. At the end of the periods of drug and placebo therapy, determinations of maximum breathing capacity and vital capacity were repeated.

In the second phase of the investigation, six asthmatic patients were selected for the study of the immediate effects of visammin administered intramuscularly. There were four men and two women between the ages of 29 and 58 years. The patients were sent to the laboratory during acute attacks of asthma. The maximum breathing capacity and the vital capacity and its compartments were determined and the "normal" maximum breathing capacity and vital capacity predicted as described above. Each patient was then given 300 mg. of visammin intramuscularly. Thirty to 50 minutes later, determinations of the maximum breathing capacity and vital capacity were repeated.

The patients were subsequently given 0.5 gm. of aminophylline intravenously (three instances) or 0.3 cc. of 1:1000 epinephrine subcutaneously, and the maximum breathing capacity and vital capacity were determined 20 to 30 minutes later. For four patients, this was done at the initial session, and for two patients it was done one week later.

RESULTS

In none of the eight patients treated with visammin administered orally was there any significant change in the severity or course of the asthma as evaluated by frequency of acute attacks, number of injections of epinephrine, or physical findings (table 1). None of the patients felt that visammin relieved an acute attack of asthma, although one patient thought the placebo brought relief. The only toxic symptom reported was nausea for a few days in one patient.

TABLE 1.—*Results of Visammin and Placebo Therapy*

Patient	Sex	Age, Yr.	Status*	Duration of Asthma	Duration of Therapy, Wk.		No. of Injections of Epinephrine	
					Placebo	Visammin	Placebo	Visammin
A. A.	M	38	OPD	30 yr.	2	2	7	6
J. B.	M	29	Hospital	8 mo.	1	1	0	2
I. G.	F	34	OPD	9 yr.	2	2	0	0
S. J.	M	33	OPD	21 yr.	2	2	1	3
M. L.	F	37	OPD	9 yr.	2	2	0	0
L. R.	M	48	OPD	8 yr.	2	2	0	0
J. T.	M	30	Hospital	5 yr.	1	1	3/day	3/day
J. W.	F	34	OPD	10 yr.	2	2	0	0

* OPD = Outpatient department.

Spirometric tracings at the beginning of the study revealed slowing of expiration during determination of the vital capacity and trapping of air during determination of the maximum breathing capacity in every patient. Although the vital capacity was significantly below normal in only one of the eight patients, the maximum breathing capacity was significantly reduced in seven of the eight in this group. The air velocity index was less than one in every patient, with a mean value of 0.68. The

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mean percent of the vital capacity expired during the first second was 46% (normal 84%). These findings are typical for bronchial asthma (table 2).

In evaluating the effects of treatment from the spirometric data, changes of 20% or greater from the control level were considered significant. In only three of seven

TABLE 2.—*Respiratory Capacity, Before Treatment, of Patients Given Visammin Orally*

Patient	Maximum Breathing Capacity: Liters per Min., B.T.P.S.*	Maximum Breathing Capacity: % Predicted	Vital Capacity: Liters per Min., B.T.P.S.	Vital Capacity: % Predicted	A.V.I.†
A. A.	89	84	4.23	102	0.82
J. B.	69	56	3.05	74	0.76
I. G.	48	53	2.72	91	0.58
S. J.	114	82	5.55	136	0.60
M. L.	69	70	3.61	115	0.61
L. R.	65	61	2.49	68	0.90
J. T.	77	61	5.95	143	0.43
J. W.	58	67	2.69	91	0.74
Mean	..	66.7	....	101	0.68

* B.T.P.S. = Body temperature, ambient pressure, saturated with water vapor.

† Air velocity index = $\frac{\%\text{ predicted M.B.C.}}{\%\text{ predicted V.C.}}$

patients was there a significant increase in maximum breathing capacity following the administration of isopropylarterenol hydrochloride as an aerosol. After treatment with visammin administered orally, the maximum breathing capacity was increased in three patients, but the increase was minimal, 22% more than the control in all instances. Treatment with placebo resulted in improvement in one patient. This patient was one of the three who improved after administration of visammin, but his response to the placebo was much greater, an increase of 60% as opposed to 22%. In no patient was there a significant rise in vital capacity after visammin was administered orally, although two patients showed improvement after the placebo (table 3).

TABLE 3.—*Response to Isopropylarterenol Hydrochloride Aerosol, Visammin, and a Placebo Given Orally*

Patient	Maximum Breathing Capacity, % Change from Control: After Isopropylarterenol Aerosol	After Visammin	After Placebo
A. A.	+ 20	+ 6	− 21
J. B.	.....	+ 22	+ 60
I. G.	− 19	− 29	− 42
S. J.	+ 20	− 19	− 4
M. L.	− 1	− 3	− 29
L. R.	+ 5	− 22	− 3
J. T.	+ 31	+ 22	− 45
J. W.	+ 2	+ 22	+ 5

The control studies of the six patients treated with visammin administered intramuscularly showed a severer degree of bronchospasm than the preceding group. The mean maximum breathing capacity as per cent of the predicted normal value was 34.2% as opposed to 66.7% in the orally treated group, and the mean vital capacity as per cent of the predicted normal value was 73.2% as opposed to 101%. The mean air velocity index was 0.49 as opposed to 0.68. All patients showed a response to epinephrine administered subcutaneously or aminophylline given intravenously (table 4).

Soon after the injection of visammin, all patients reported that they felt partially relieved of their dyspnea. The physiological measurements, however, failed to confirm this subjective impression. The mean increase in maximum breathing capacity expressed in per cent change from control was + 6.8%, ranging from − 3 to + 22%, while after epinephrine or aminophylline was administered, the mean increase was + 49.7%, ranging from + 24 to + 90%. In every patient, the per cent change in maximum breathing capacity after visammin was administered intramuscularly was greatly exceeded by the change after the administration of the known bronchodilator (table 5).

TABLE 4.—*Respiratory Capacity, Before Treatment, of Patients Given Visammin Intramuscularly*

Patient	Maximum Breathing Capacity: Liters per Min., B.T.P.S.*	Maximum Breathing Capacity: % Predicted	Vital Capacity: Liters per Min., B.T.P.S.*	Vital Capacity: % Predicted	A.V.I.†
F. C.	26	26	3.18	86	0.30
P. S.	33	40	2.50	76	0.53
R. I.	19	21	1.07	35	0.60
B. S.	36	41	1.58	71	0.58
B. K.	36	51	2.09	84	0.61
F. W.	29	26	3.70	87	0.29
Mean	..	34.2	....	73.2	0.49

* B.T.P.S. = Body temperature, ambient pressure, saturated with water vapor.

† Air velocity index = $\frac{\%\text{ predicted M.B.C.}}{\%\text{ predicted V.C.}}$

TABLE 5.—*Response to Visammin Administered Intramuscularly and a Known Bronchodilator Drug*

Patient	Maximum Breathing Capacity, % Change from Control: After 300 Mg. of Visammin I.M.	After Bronchodilator
F. C.	+ 22	+ 90 *
P. S.	+ 9	+ 45 †
R. I.	+ 5	+ 42 *
B. S.	0	+ 42 †
B. K.	+ 8	+ 24 †
F. W.	− 3	+ 55 *
Mean	6.8	49.7

* Aminophylline, 0.5 gm. administered intravenously.
† Epinephrine, 1:1000, 0.3 cc. administered subcutaneously.

COMMENT

The evaluation of therapeutic measures in treating bronchial asthma presents many problems. Simple clinical evaluation is made difficult by the large number of uncontrollable variables, which include the remissions and exacerbations that characterize asthma, the numerous etiological factors of the condition, the presence of concomitant disease, and often the rapport between patient and physician. Some of these difficulties can be overcome by the use of controls and by an attempt to evaluate results by more precise objective tests.

The vital capacity has been widely used as a measure of ventilatory dysfunction in asthma. Although reduction of vital capacity occurs consistently during severe attacks of bronchial asthma, it is now recognized that this measurement alone is often inadequate and misleading.[6a] The

maximum breathing capacity is a test in which the patient voluntarily hyperventilates to the maximum of his ability for 15 to 30 seconds. The volume of air expired or inspired during this time is measured and the result expressed in liters per minute. The maximum breathing capacity measures the maximum volume of air that can be moved per unit of time, while the vital capacity measures only the maximum volume of air that can be moved in a single respiratory effort, irrespective of time. The maximum breathing capacity is therefore a much better measure of bronchial obstruction in asthma. Additional information can be gained by correlating the maximum breathing capacity and vital capacity; for example, in bronchial asthma, in which resistance to air flow is one of the major dynamic physiological manifestations, there will be a proportionally greater reduction in the maximum breathing capacity than in the vital capacity. In conditions in which interference with the function of the thoracic bellows is the major factor, as in uncomplicated kyphoscoliosis, the opposite will hold true. Gaensler has expressed this relationship as a ratio $\frac{\% \text{ of predicted maximum breathing capacity}}{\% \text{ of predicted vital capacity}}$ and has designated the resulting number as the air velocity index. In normal persons and in patients with stroke volume defects, the index is one or larger; in persons with asthma or emphysema, the air velocity index is less than one. In the evaluation of a drug as a bronchodilator, bronchospasm must first be demonstrated in the patient, and the drug must be given in adequate dosage. In this study, the criterion used for the presence of bronchospasm was response to a known bronchodilator drug. All the patients treated with visammin administered orally showed prompt clinical response to epinephrine administered subcutaneously. The failure to demonstrate a response to isopropylarterenol hydrochloride administered as an aerosol in four of the seven patients in this group led us to use aminophylline intravenously or epinephrine subcutaneously in the group given visammin intramuscularly. A clear-cut response was obtained in every instance.

We were unable to demonstrate any consistent or appreciable bronchodilator effect of visammin given orally in a dose of 120 mg. daily, using both clinical and laboratory methods of evaluation. This dose is lower than that used by other investigators but was selected because of the duration of the study and the known cumulative properties of the drug. To exclude the possibility of inadequate dosage and because visammin was reported to be more effective as a bronchodilator by the intramuscular route, the second phase of this study was undertaken; however, visammin administered in 300 mg. doses intramuscularly had no demonstrable bronchodilator effect.

It is our feeling that even carefully performed and controlled ventilatory function tests have limitations, as far as asthma is concerned, for precise evaluation of therapeutic agents. It seems obvious to us that simple subjective or clinical observations are subject to even greater limitations and more critical interpretation. In the case of visammin, wider usage and additional controlled clinical and laboratories studies will determine its role in the treatment of bronchial asthma.

SUMMARY AND CONCLUSIONS

1. Visammin (khellin), 120 mg. daily, and a placebo were administered orally during alternate periods to eight patients with chronic asthma. The bronchodilator effects of the drug were evaluated by comparison with known bronchodilator drugs using clinical and laboratory methods.

2. A total of 300 mg. of visammin was given intramuscularly to six patients during acute asthmatic attacks and its bronchodilator effects compared with epinephrine or aminophylline.

3. In the dosage used, no significant bronchodilator effect of visammin given orally or intramuscularly could be demonstrated.

29th St. and Ellis Ave. (Dr. Snider).

CLINICAL NOTES

TRYPSIN IN POLIOMYELITIS PATIENTS WITH TRACHEOTOMY

Alex J. Steigman, M.D.
and
Carl H. Scott, M.D., Louisville, Ky.

During the acute phase of poliomyelitis the commonest cause of death is inadequate ventilation. The means for ensuring adequate ventilation must be highly individualized at frequent intervals. Abrupt periods of cyanosis erroneously ascribed to "central episodes" often yield to prompt reestablishment of pulmonary oxygenation and carbon dioxide removal. In properly selected instances, tracheotomy facilitates access to the tracheobronchial tree for aspiration, lavage, and oxygen therapy. In poliomyelitis patients on whom tracheotomy has been done viscid tracheobronchial secretions soon develop. To some degree this may be countered by adequate systemic hydration, attempted humidification of room air or oxygen, administration of appropriate antibiotics locally and systemically, and tracheal instillation of saline or other fluids prior to aspiration. Despite the use of such measures, tenacious viscid mucoid secretions often result in progressive impairment of ventilation. Aspiration of secretions through the tracheotomy opening must be done swiftly to avoid aggravating the existing hypoxia. The more fluid the secretions the more rapidly aspiration is accomplished.

We have used the mucolytic effect [1] of the crystalline enzyme trypsin ("tryptar") to seemingly good advantage in such patients. During the 1952 epidemic of poliomyelitis, we have thus far had 110 patients who required

From the Louisville General Hospital and the Department of Pediatrics, University of Louisville School of Medicine.

1. Limber, C. R.; Reiser, H. G., and Roettig, L. C.: Enzymatic Lysis of Respiratory Secretions by Aersol Trypsin, J. A. M. A. 149: 816 (June 28) 1952.

mechanical respirators, 54 of whom required tracheotomy. Our favorable impressions concerning the effect of the trypsin solution are derived entirely from clinical experience with these and similar patients seen in other epidemics.

The solution used contains 250,000 units of trypsin, 1,000,000 units of aqueous penicillin, 60 mg. of phenylephrine (neo-synephrine®) hydrochloride, and 50 ml. of Sorenson's phosphate buffer solution (pH=7.1). Since trypsin is relatively unstable, small amounts of the solution are made and kept refrigerated when not in use. Its lytic effect is rapidly diminished after a few hours at room temperature. About 3 ml. of the solution is instilled into the tracheotomy tube. After waiting 3 to 5 minutes, swift aspiration of the tracheobronchial tree is performed with a soft rubber catheter, the distal tip of which is cut at a 45 degree angle. By turning the patient's head sharply to the right it is generally possible to enter the left main stem bronchus and vice versa. The same solution may be employed in a vaponefrin® nebulizer connected by means of a Y-tube to a tank of oxygen or compressed air. The "smoke" so created is inhaled promptly.

We have observed no signs of local or systemic irritation, even when this treatment has been used hourly. Application every few hours is generally adequate, provided suction with or without saline broncholavage and humidification of oxygen is carried out between treatments. We have been frequently gratified to find that stringy tenacious exudate assumes a semiliquid character following treatment.

101 W. Chest St. (Dr. Steigman).

DANGERS OF EMERGENCY OCCLUSIVE DRESSING IN SUCKING WOUNDS OF THE CHEST

B. W. Haynes Jr., M.D., Houston, Texas

The dictum "close all sucking wounds promptly" has been the guiding principle of emergency treatment of perforating wounds of the chest in preparation for adequate debridement and accurate closure by sutures in the operating room. Adherence to this concept has undoubtedly saved many lives; it is true, however, that a tension pneumothorax may occur shortly after application of an occlusive dressing to a sucking wound. Standard reference works on the treatment of such injuries properly emphasize the importance of immediate closure of the opening but fail to associate clearly emergency closure by occlusive dressing with tension pneumothorax. Such a sequence of events, under the circumstances, may be anticipated to occur with some regularity. The following case will illustrate the point.

REPORT OF A CASE

M. H., a 22-year-old white man, was admitted to the Jefferson Davis Hospital about one and one-half hours after being wounded in a knife fight. He was in shock on arrival, with a blood pressure of 76/60 mm. Hg, a pulse rate of 120, and moderate peripheral vasoconstriction. He was breathing with moderate difficulty but was not cyanotic. With each inspiration and expiration a sucking noise arising from the right side of the chest was evident. Closer examination revealed a 12 cm. laceration in the sixth intercostal space anteriorly on the right. Superficial lacerations of the face, abdomen, and right thigh were also observed.

The chest wound was immediately closed at full expiration with an occlusive dressing of petroleum gauze, sterile sponges, and adhesive plaster. Shock therapy was instituted. About 30 minutes later, just prior to being transported to surgery for definitive wound therapy, the patient became dyspneic, cyanotic, and agitated. Examination revealed distinct hyperresonance of the right side of the chest, with the trachea shifted to the left. The occlusive dressing was quickly removed, and air gushed from within the chest. The patient's condition immediately improved. A catheter was placed in the chest and was surrounded by an occlusive wound dressing and attached to water-sealed drainage apparatus. Definitive wound therapy was then done, and at the same time a laceration of the right middle lung lobe was repaired. One day later, secondary hemorrhage into the chest cavity on the right side necessitated a second operation, after which the patient recovered with no further significant event. He was discharged from the hospital on the ninth postoperative day.

COMMENT

Although the entities of tension pneumothorax and open pneumothorax have been adequately described individually, their association produced by emergency occlusive dressing in penetrating injuries of the chest has not been adequately stressed. Their association produced by wound suture and the other complications of open pneumothorax that may occur, such as mediastinal emphysema and empyema, however, have been clearly set forth.[1] Previous recognition of this problem by Tiegel[2] led to the designing of an occlusive dressing incorporating a flutter valve to relieve intrathoracic pressure. To meet the future possibility of such complications, I have adopted the policy of immediately closing all sucking chest wounds, pending definite wound therapy, with an occlusive dressing in which a catheter has been incorporated that extends through the wound into the chest and that can be attached to water-sealed drainage apparatus. A flutter valve could be used for this same purpose, but it lacks the advantage a closed system has of collecting blood as well as air. The use of such a device would have prevented the near disaster in the case described.

From the Department of Surgery, Baylor University College of Medicine and the Jefferson Davis Hospital.

1. De Bakey, M. E.: The Management of Chest Wounds: Collective Review, Internat. Abstr. Surg. **74**: 203, 1942; in Surg., Gynec. & Obst. (March) 1942. Carter, B. N., and De Bakey, M. E.: Current Observations on War Wounds of the Chest, J. Thoracic Surg. **13**: 271, 1944.

2. Tiegel, M.: Über Ventildrainage bei Thoraxverletzungen insbesondere bei Brustschüssen, Zentralbl. f. Chir. **64**: 2775, 1937.

Identification of Parathyroid Glands.—. . . a normal parathyroid gland of an adult is rather easily recognizable grossly. The most distinguishing characteristic is its yellowish brown color which is quite different from that of the thyroid gland, the thymus, fat or lymph nodes. The gland has a delicate, but definite capsule beneath which the subcapsular vessels are apparent. The vessels enter at a more or less well-defined hilus. The form of the gland varies greatly depending chiefly on its location; in loose areolar tissue it is globular or oval; when caught between neighboring structures or within a sulcus of the thyroid it is flattened, elongated or otherwise distorted. The average weight is from 30 to 40 mg. Each gland is enclosed in a minute pad of fat which, however, rarely covers the gland to the extent that its color is completely obscured.—B. M. Black, M.D., *Surgical Clinics of North America*, August, 1952.

COUNCIL ON PHARMACY AND CHEMISTRY

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

R. T. STORMONT, M.D., *Secretary.*

Diphtheria and Tetanus Toxoids, Alum Precipitated-U.S.P. (See New and Nonofficial Remedies 1952, p. 388).

Eli Lilly & Company, Indianapolis

Combined Diphtheria-Tetanus Toxoids (Alum Precipitated): 1 cc. vial (one immunization) and 5 cc. vial (five immunizations). Preserved with thimerosal 1:10,000.

Aminophylline-U.S.P. (See New and Nonofficial Remedies 1952, p. 294).

The Bowman Bros. Drug Co., Canton, Ohio

Solution Aminophylline: 2 cc. ampuls. A solution containing 0.25 gm. of aminophylline in each cubic centimeter. 10 cc. ampuls. A solution containing 25 mg. of aminophylline in each cubic centimeter.

The Evron Company Inc., Chicago.

Tablets Aminophylline: 0.1 gm. and 0.2 gm. plain and 0.2 gm. enteric coated.

Neostigmine Methylsulfate-U.S.P. (See New and Nonofficial Remedies 1952, p. 174).

E. S. Miller Laboratories, Inc., Los Angeles

Solution Neostigmine Methylsulfate 1:1,000: 10 cc. vials. An isotonic solution containing 1 mg. of neostigmine methylsulfate in each cubic centimeter. Preserved with 0.02% propylparaben and 0.18% methylparaben.

Hexachlorophene (See New and Nonofficial Remedies 1952, p. 50).

J. I. Holcomb Manufacturing Company, Indianapolis

Liquid Soap Hexachlorophene: 3.78, 18.9, 56.7, 113.4 and 208.1 liter containers. A soap containing 0.5% hexachlorophene (2% anhydrous basis).

Mannitol Hexanitrate (See New and Nonofficial Remedies 1952, p. 228).

Premo Pharmaceutical Laboratories, Inc., South Hackensack, N. J.

Tablets Mannitol Hexanitrate: 32 mg.

The Bowman Bros. Drug Company, Canton, Ohio.

Tablets Mannitol Hexanitrate: 32 mg.

Ethinyl Estradiol (See New and Nonofficial Remedies 1952, p. 336).

Vanpelt & Brown, Inc., Richmond, Va.

Tablets Oradiol: 0.02 mg. and 0.05 mg. U. S. Patents 2,251,939 and 2,265,976.

Propylthiouracil-U.S.P. (See New and Nonofficial Remedies 1952, p. 408).

Raymer Pharmacal Company, Philadelphia

Tablets Propylthiouracil: 50 mg.

Heparin Sodium-U.S.P. (See New and Nonofficial Remedies 1952, p. 208).

Premo Pharmaceutical Laboratories, Inc., South Hackensack, N. J.

Solution Heparin Sodium: 10 cc. vials. A solution containing 1,000 U.S.P. units of heparin sodium in each cubic centimeter. Preserved with 0.5% chlorobutanol.

Solution Heparin Sodium: 10 cc. vials. A solution containing 5,000 U.S.P. units of heparin sodium in each cubic centimeter. Preserved with 0.45% phenol.

Invert Sugar (See New and Nonofficial Remedies 1952, p. 412).

Abbott Laboratories, North Chicago, Ill.

Solution Invert Sugar 5% in Water (or Saline): Abbo-Liter bottles. A solution in water or isotonic sodium chloride containing 50 mg. of invert sugar in each cubic centimeter.

Solution Invert Sugar 10% in Water (or Saline): Abbo-Liter bottles. A solution in water or isotonic sodium chloride containing 0.1 gm. of invert sugar in each cubic centimeter.

Dihydrostreptomycin-U.S.P. (See New and Nonofficial Remedies 1952, p. 130).

Abbott Laboratories, North Chicago, Ill.

Solution Dihydrostreptomycin Sulfate: 2 cc. vial. A solution containing dihydrostreptomycin sulfate equivalent in activity to 0.5 gm. of dihydrostreptomycin base in each cubic centimeter. Preserved with 0.9% benzyl alcohol and 0.1% sodium metabisulfite.

Dimethyl-Tubocurarine Iodide (See New and Nonofficial Remedies 1952, p. 429).

Eli Lilly & Company, Indianapolis.

Solution Metubine Iodide: 20 cc. ampuls. An isotonic salt solution containing 2 mg. of dimethyl-tubocurarine iodide in each cubic centimeter. Preserved with 0.5% phenol.

Thiamine Hydrochloride-U.S.P. (See New and Nonofficial Remedies 1952, p. 466).

Boyle & Company, Los Angeles

Tablets Thiamine Hydrochloride: 5 mg. and 10 mg.

***p*-Aminosalicylic Acid** (See New and Nonofficial Remedies 1952, p. 87).

Hexagon Laboratories, Inc., Bronx, N. Y.

Powder Para-Aminosalicylic Acid: Bulk; for manufacturing use.

Estrogenic Substances, Conjugated (See New and Nonofficial Remedies 1952, p. 338).

E. S. Miller Laboratories, Inc., Los Angeles.

Tablets Hormesteral: 1.25 mg.

Mephenesin (See New and Nonofficial Remedies 1952, p. 432).

Rexall Drug Company, Los Angeles.

Tablets Mephenesin: 0.5 gm.

Sodium *p*-Aminosalicylic (See New and Nonofficial Remedies 1952, p. 88).

Hexagon Laboratories, Inc., Bronx, N. Y.

Powder Sodium Para-Aminosalicylate: Bulk; for manufacturing use.

Diethylstilbestrol-U.S.P. (See New and Nonofficial Remedies 1952, p. 341).

Boyle & Company, Los Angeles

Tablets Diethylstilbestrol: 5 mg.

Hexestrol (See New and Nonofficial Remedies 1952, p. 345).

Physicians' Drug & Supply Company, Philadelphia

Tablets Hexestrol: 1 mg. and 3 mg.

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LEPTOSPIROSIS IN MAN AND ANIMALS

Human and animal infections with spirochetes of the genus Leptospira have received increasing attention in recent years. It has been found that at least 30 serologically distinguishable strains of Leptospira are pathogenic for man [1] and that infections with these organisms may produce a variety of symptoms simulating influenza, infectious hepatitis, infectious mononucleosis, aseptic meningitis, poliomyelitis, brucellosis, tuberculosis, or other diseases. Many examples of such infections have been reported from other countries but relatively few from the United States. It has, however, been demonstrated that leptospiral infections are widespread among domestic animals in this country [2] and that the conditions necessary for the transmission of these organisms from animals to man are prevalent. It is probable, therefore, that many cases of human leptospirosis occur unrecognized in the United States because of the lack of awareness of these diseases on the part of physicians and the relative scarcity of facilities for their laboratory diagnosis. In recognition of the need for increased emphasis on this problem, the Army Medical Service Graduate School, Washington, D. C., is sponsoring a symposium on leptospirosis Dec. 11-12, which some 300 civilian and military scientists are planning to attend.

At least six of the many pathogenic species of Leptospira have been recognized as the cause of human leptospirosis in this country. These six are L. icterohaemorrhagiae, producing spirochetal jaundice (Weil's disease); L. canicola, producing canicola fever [3]; L. pomona, causing swineherd's disease [4]; L. grippotyphosa, producing swamp fever [5]; L. autumnalis, responsible for pretibial fever (Fort Bragg fever, autumnal fever [6]); and L. bataviae, producing Indonesian Weil's disease. It is probable that infections with other organisms will be found in the future. The clinical manifestations of these diseases are protean, but they have certain features in common. Infections due to one organism differ from infections due to another chiefly in the severity of symptoms. The illness often appears suddenly with fever, malaise, myalgia, and intestinal disturbances. The chief sites of involvement are the liver, kidneys, meninges, and eyes. Liver damage is severe enough to produce jaundice in only about 50% of patients with Weil's disease and in 15% of those infected with other Leptospira organisms. Kidney damage takes the form of transitory acute nephritis with albumin, casts, and red blood cells in the urine, and usually some azotemia. Symptoms of meningeal irritation resembling those seen in virus diseases may be the dominant feature in some cases, particularly those due to L. pomona. In these cases, the spinal fluid shows a variable pleocytosis, with counts up to 3,000 cells per cubic millimeter, a slight increase in protein content, and a normal dextrose content. Iritis, iridocyclitis, and conjunctivitis also occur fairly commonly.

Man is infected with Leptospira through contact with infected animals or their excreta. The brown rat (Rattus norvegicus) is the primary host of L. icterohaemorrhagiae, while swine, cattle, dogs, and man serve as secondary hosts, acquiring infection from the rat or from each other.[2] From 4% to 60% of rats in the eastern part of the United States are infected with this organism. Human infection is often acquired occupationally by sewer workers, tunnel diggers, barge workers, sugar cane cutters, and others who work in wet areas that are contaminated by rat excreta. The dog is the sole animal reservoir for L. canicola, man acquiring the infection through contact with the urine of this house pet. Serologic or cultural evidence of L. canicola infection has been found in about 25% of dogs examined in Detroit, Ohio, and northern California. Primary hosts for L. pomona are swine and cattle. Serologic evidence of previous infection was found in 2% to 3% of these animals surveyed in Ohio. Water contaminated by infected hogs has produced an epidemic of L. pomona meningitis in swimmers in Alabama,[7] and contact with infected animals in an abattoir has produced L. pomona iridocyclitis.[8] L. grippotyphosa and L. autumnalis have not yet been found in animals in this country, but infected dogs, horses, cattle, and field mice have been encountered in other countries.[2]

The diagnosis of leptospirosis is made on the basis of clinical suspicion plus agglutination tests and/or animal inoculations or cultures. The agglutination-lysis test of Schüffner and Mochtar or one of its modifications is generally regarded as the most reliable and conclusive diagnostic procedure, although cross reactions between species do occur. These can be clarified by the use of absorption and animal protection tests. There is no one agglutination titer that is diagnostic of present infection, a rising titer reaching a maximum within two to eight weeks being the most reliable sign of active infection. Detectable antibodies may disappear in one month or may persist in a titer as high as 1:300 for many years. False positive and anamnestic reactions are rare.[9] A new

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3. Rosenberg, B. L.: Canicola Fever: Review, with Report of Two New Cases, Am. J. Med. **11**: 75 (July) 1951.
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and comparatively simple complement fixation test developed by the Army Medical Service Graduate School has shown some promise. The antigen for this test is being distributed to all army installations. For culture or animal inoculation the patient's blood should be collected during the first week of illness or the urine during the second to the fourth week. Since cultures require five to six weeks for growth they are of little immediate value. Inoculation of infected material into young golden hamsters or young guinea pigs will result in death of the animal in 2 to 12 days. Lesions containing many Leptospira organisms will be found in the liver and kidneys.

Treatment of human leptospirosis with penicillin has given good results in some cases and poor results in others. There is evidence that aureomycin [10] and terramycin [11] give better results in some types of infection. Active immunization with heat-killed Leptospira organisms has been accomplished with some success.[12] Permanent immunity usually follows a natural leptospiral infection.

Antigens for the performance of agglutination or complement fixation tests are available at the Communicable Disease Center, United States Public Health Service, Chamblee, Ga., and at the Veterinary Division of the Army Medical Service Graduate School, Washington, D. C. Physicians wishing to send blood samples for such tests can correspond with these centers.

RESPIRATORY TRACT INVOLVEMENT IN CYSTIC FIBROSIS OF PANCREAS (MUCOVISCIDOSIS)

Respiratory tract involvement has been recognized as part of the clinical picture of cystic fibrosis of the pancreas since it was first described by Passini in 1919. Andersen, in 1938, correlated the pancreatic changes with the development of steatorrhea and pneumonia and established cystic fibrosis of the pancreas as a clinical entity.[1] Evidence of vitamin A deficiency in many of the patients in Andersen's series suggested that the pulmonary infection might be secondary to vitamin A deficiency, induced by lowered absorption due to the pathological state of the pancreas. This view led to treatment based principally on nutritional measures. Little or no attempt was directed to control of the pulmonary symptoms.

A series of uninterrupted studies over the past 15 years at the Boston Children's Hospital, calling into play a number of such diverse disciplines as pathology, chemistry, bacteriology, nutrition, pulmonary and cardiac physiology, and genetics have demonstrated that mucoviscidosis (pancreatic fibrosis) in infants is commoner than generally believed, that the manifestations of the disease are not limited to the pancreas, and that, although nutritional treatment must be carried out, therapy directed primarily to the pulmonary symptoms results in a more satisfactory prognosis than nutritional therapy alone.

Farber [2] of the Boston group described the generalized nature of the disease and suggested the name mucoviscidosis to signify an essential alteration in the mucus-secreting glands as the primary defect. Shwachman and co-workers [3] emphasized the frequency of pulmonary symptoms at all stages of the disease. The earliest respiratory symptom is usually cough which often appears during the first months of life. The cough may become increasingly severe and may be associated with wheezing respiration or dyspnea, or it may become paroxysmal, suggesting pertussis. Repeated attacks of upper respiratory tract infection and bronchopneumonia are common. Progression of the pulmonary process may lead to bronchiectasis, empyema, and lung abscesses.

As a result of these observations, Shwachman and coworkers directed their therapeutic efforts primarily toward the control of the pulmonary infection. To this end, they introduced the use of prolonged continuous therapy with relatively small doses of the wide spectrum antibiotics aureomycin and terramycin. With this therapeutic regimen, they report not only that respiratory symptoms are kept at a minimum but that striking improvement in the general nutritional state also occurs. Indeed, this reorientation of outlook has altered the outlook from one of pessimism to one of cautious optimism.

The mode of action of the antibiotics in the treatment of mucoviscidosis is not altogether clear. The bacterial flora of the nasopharynx of children treated with aureomycin and with terramycin showed little significant change, and patients continued to show a favorable clinical effect despite the appearance of resistant strains of bacteria. Shwachman and his associates suggest that these antibiotics may have some other action than a purely bacterial one. Certainly the rapid and striking nutritional changes merit further study.

These results raise many interesting questions, not only in regard to mucoviscidosis but as to the place of the wide spectrum antibiotics in infant nutrition. The influence of small amounts of antibiotics in accelerating the growth of farm animals, the influence of penicillin in raising vitamin A blood levels and accelerating growth of chicks with an undescribed infection,[4] and the thesis that small amounts of antibiotics alter the character of the intestinal flora are suggestive of lines provocative of investigation.

While the more difficult studies on mechanism and the familial occurrence of mucoviscidosis are being undertaken, the family physician and pediatrician can take advantage of the current findings by being aware of the pulmonary symptoms to cast suspicion on the presence of the disease in infants. For, as the Boston group points out, the earlier a diagnosis of the disease is made the more favorable is the hope for prolonging life.

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BACTERIOLOGY AND MEDICATION IN OTITIS EXTERNA

It has been variously estimated that infection of the cutaneous surface of the external auditory canal (otitis externa) constitutes from 5 to 40% of all cases encountered in otological practice in the United States,[1] the wide variation being due to sectional differences in temperature and humidity. By virtue of its exposed position, the external auditory canal is open to invasion by numerous micro-organisms; a moist milieu containing cellular detritus and cerumen often serves as an adequate culture medium for the growth of bacteria and fungi. While the causative agent of infection of the cutaneous surface of the external auditory canal can be any one of a variety of bacteria and fungi, it is quite probable that the role of the latter, whether as primary or secondary agents of infection, has been exaggerated.[2]

Judicious selection of topical medication for the treatment of infections of the external auditory canal depends greatly on the bacteriology of the infectious process. The causative agent of otitis externa can be any one of a variety of gram-positive or gram-negative bacteria and fungi. The microbiologic flora of the external auditory canal in otitis externa, which in most instances is mixed, differs from the flora of the normal auditory canal in the same clime by the inclusion of one or more pathogens. Among the commoner causative agents of otitis externa are Pseudomonas aeruginosa (Bacillus pyocyaneus), Staphylococcus aureus hemolyticus, Staph. albus, streptococci, diphtheroids and Escherichia coli, and various fungi, notably Aspergillus, Actinomyces, and Monilia.

According to Hayes and Hall,[3] otogenic infections in the temperate zone are essentially of two kinds: a winter type due to gram-positive organisms and a summer type due to gram-negative organisms. During hot weather there is an increase in the incidence of external otogenic infections as well as exacerbations of chronic otogenic infections that have been artificially activated by swimming, excessive perspiration, and bathing. The primary infective agents in this group are the gram-negative Ps. aeruginosa, although in external otitis both gram-positive and gram-negative organisms are frequently present.

Recent investigations reveal that in a large proportion of cases of otitis externa the infection is caused by Ps. aeruginosa and that fungi are relatively secondary in importance to this organism. Infections caused by gram-positive organisms present relatively little difficulty. It is in the control of gram-negative organisms and fungi that the problem of selecting appropriate acid medication frequently arises; here antibiotic sensitivity tests can provide valuable aid to clinicians in the selection of the most effective antimicrobial drugs against infection of the cutaneous surface of the external auditory canal.[4]

1. Gill, W. D.: Otitis Externa, Ann. Otol., Rhin. & Laryng. **51**: 370 (June) 1942.

2. Syverton, J. T.; Hess, W. R., and Krafchuk, J.: Otitis Externa: Clinical Observations and Microbiologic Flora, Arch. Otolaryng. **43**: 213 (March) 1946.

3. Hayes, M. B., and Hall, C. F.: A Newer Concept of the Management of Otogenic Infection, Arch. Otolaryng. **47**: 289 (March) 1948.

4. Mitchell, R. B.; Arnold, A. C., and Lett, J. E.: Rapid Antibiotic Sensitivity Determinations for Pseudomonas Aeruginosa Isolated from External Otitis, Laryngoscope **61**: 649 (July) 1951.

FOOD PRODUCTION BY FUNGI

All countries are faced today with such diverse problems as obtaining sufficient food to support their populations, providing adequate amounts for export to countries deficient in food resources, storing food against the possibility of crop failure or famine, and, finally, providing food reserves for use in the event of war or other worldwide catastrophe. Procedures aimed at increasing food production are sought constantly. Some of the better-known methods include soil and water conservation, improved agricultural technology, grassland and livestock improvement, and the exploitation of new, productive acreage.

Scientists concerned with increased food production appear to agree that the food requirements of the second half of the 20th century can be met by conventional methods; for example, vast areas of unproductive land throughout the world could, if properly irrigated, enhance food production far above current levels. Moreover, while 98% of the present crop of fish, totaling 37 billion lb. per year, comes from the waters of the Northern Hemisphere, the expansive waters of the Southern Hemisphere provide an almost limitless source of protein and fat. In the United States alone, 50% of the farmers raise 90% of the food.

While current food production throughout the world could be increased by conventional methods, some fear exists that the rate of progress for the expansion and distribution of agricultural products may at some future time prove too slow for widespread hunger to be avoided. Many investigators in the field maintain that it is not enough to increase the amount of food now grown and that it is essential both to raise the caloric intake of undernourished peoples and to provide them with adequate mineral, vitamin, and protein elements. Methods now extant for the conversion of carbohydrates and nitrogen to protein are relatively inefficient; however, several fermentation processes, which utilize fungi as the converting organism, have been evolved to transform nutritionally valueless substances into high-protein foods. Fungi can be produced in quantity within a few hours or days. The proteins present in fungi are surprisingly similar to those found in meat. Their efficiency in producing protein from a given quantity of carbohydrates is about 65%, as compared to approximately 20% for pork, 15% for milk, 5% for poultry, and 4% for beef. At present, investigators are attempting to develop an economically feasible process for the production of good high-protein food for human consumption from waste products.

All factors considered, the possibilities of finding an inexpensive, nutritiously suitable, low-cost fungus food are challenging. According to Robinson,[1] there is reason to believe that synthetic photosynthesis may become a reality within the next decade or two, so that the need for any other nonconventional method of augmenting the food supply could be dispensed with. However, until this is realized, the study of fungi offers an interesting field of exploration for those concerned with increasing the food supply.

1. Robinson, R. F.: Food Production by Fungi, Scientific Monthly **75**: 149 (Sept.) 1952.

MEDICAL NEWS

ILLINOIS

State-Supported Narcotics Clinics.—Chicago's third state-supported narcotics clinic was recently opened at Northwestern University Medical Center under the direction of Dr. Benjamin Boshes. Other clinics operating in cooperation with the Illinois Department of Public Health are located at Provident Hospital and the University of Illinois Medical Center. Dr. G. Howard Gowen, deputy director in charge of the department's narcotic program, reports that there have been 170 referrals since the first clinic (Provident) opened Dec. 1, 1951, with 80% in the 17-28 age bracket, 30% of the total ranging from 17 to 20 years of age. Male referrals outnumbered females 5:1 in the first 11 months. Most of these persons were single or separated from their families. Only 25% had graduated from high school; about 10% had attended college for some time. Limited experience to date has shown that 82% of the persons treated in the clinics have not returned to use of narcotics.

Chicago

Children's Cancer Clinic.—A children's cancer prevention clinic was recently opened at Women and Children's Hospital in Chicago by the Cancer Prevention Center of Chicago, Inc. The new clinic will be operated jointly by the Cancer Prevention Center and the hospital.

Symposium on Myocarditis.—The Chicago Heart Association will hold its clinical section meeting Dec. 9 at 8 p. m. in the Chicago Academy of Sciences Building, 2001 N. Clark St. A symposium on myocarditis with a round-table discussion will be presented by the cardiovascular department of the Medical Research Institute, Michael Reese Hospital.

Dr. Isaac Abt Honored.—In recognition of his 85th birthday, Dec. 18, the Women's Faculty Club of Northwestern University Medical School will honor Dr. Isaac A. Abt on Dec. 8 when, after dinner at the Bismarck Hotel, a benefit program will be given at the Palace Theatre. Welcoming remarks will be made by Mrs. Loyal Davis, who organized the club in 1931; "University Appreciation" by Dr. J. Roscoe Miller, president, Northwestern University; "Professional Appreciation," Dr. Richard H. Young, dean, Northwestern University Medical School; and "Community Appreciation," Dr. Eugene T. McEnery, president, Chicago Medical Society. The world premiere of the film "Stars and Stripes Forever" will conclude the program. Tickets for the performance may be obtained in Rm. 220, 134 N. LaSalle St. Downstairs seats are $7.50 each; upstairs, $5 and $3. Patrons' contributions of $25 entitle the donor to two seats.

Atomic Energy Luncheon.—The Chicago Association of Commerce and Industry will hold a luncheon meeting at the Hotel Sherman Dec. 9, in observance of the 10th anniversary of the first atomic chain reaction. Co-sponsors will include the Chicago Medical School, Northwestern University Medical School, Stritch School of Medicine, Loyola University, University of Chicago Medical School, and the University of Illinois Medical School and School of Dentistry. The theme "Application of Atomic Energy to Medicine" will be developed in the following presentations:

High Energy Radiation—What Is It; How Is It Produced? William W. Wainwright, D.D.S.
Atomic Energy in Medical Research, Harold Koenig.
Radioisotopes in Medical Diagnosis, John A. D. Cooper, Ph.D.
Effects of Heavy Doses of Radiation on Cancers, John F. Sheehan.
Effects of the Atomic Bomb on the Human Body and Measures to Combat Injury, Leon O. Jacobson.

All interested are invited to this meeting. Tables seat 10. Tickets, $2.75 each, include tax and tip. Orders for tickets should be phoned or mailed to the Chicago Association of Commerce and Industry, 1 N. LaSalle St., FRanklin 2-7700.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

LOUISIANA

X-Ray Survey.—A chest x-ray survey is being carried out in the Calcasieu-Cameron parish area with the aid of the U. S. Public Health Service, which has sent 10 mobile x-ray units for use during the survey under the supervision of Dr. Bertrand E. Bennison, Washington, D. C. All local physicians are taking part in the project, which is said to be the first mass survey of its kind in Louisiana.

Personal.—Dr. Arthur J. Walker, associate professor of tropical medicine, Tulane University of Louisiana School of Medicine, New Orleans, has been awarded a Fulbright scholarship for research in tropical medicine at the Institute of Medical Research, Kuala Lampur, Malaya. Dr. Walker, who plans to conduct malaria control research with primaquine, left for Malaya in November and will return in October, 1953.

MASSACHUSETTS

Lecture on Coronary Disease.—The House Officers' Association of New England Center Hospital announces that the next lecture in its Evening Lecture Series will be "Arterialization of the Coronary Sinus for Coronary Artery Disease" by Dr. Claude S. Beck, professor of cardiovascular surgery, Western Reserve University School of Medicine, Cleveland. Discussers will be Drs. Paul M. Zoll and Samuel Proger, both of Boston. This program will be held at 7 p. m. Dec. 12, in the Stearns Auditorium of New England Center Hospital, Boston. All interested persons are invited.

MICHIGAN

Outbreak of Food Poisoning.—The Michigan Department of Health reports that within 6 to 72 hours after eating a turkey dinner, 161 of 250 persons who attended a community dinner became ill and 2 died. Laboratory analysis of food samples showed Salmonella typhimurium.

State Medical Election.—At its annual meeting in Detroit the Michigan State Medical Society installed Dr. Reader J. Hubbell, Kalamazoo, as president and chose Dr. Leroy W. Hull, Detroit, president-elect, Dr. L. Fernald Foster, Bay City, secretary, and Dr. William A. Hyland, Grand Rapids, treasurer.

Personal.—Dr. Martin H. Hoffmann, Detroit, has been awarded the honorary degree of doctor of laws by Loras College of Dubuque, Iowa.——Dr. Henry T. Sethney of Menominee was guest of honor at a testimonial dinner recently given in Marinette by the Menominee and Marinette county medical societies. Dr. Sethney has been head of the staff of St. Joseph's Hospital, president of the Menominee County Medical Society, Menominee city health officer, and member of the Menominee Board of Education. He was given a plaque expressing the admiration of his colleagues "for his long service to medicine and to humanity on the Menominee River." A chair was presented to Dr. and Mrs. Sethney.

MINNESOTA

Psychiatric Unit for Children.—A 24 bed psychiatric unit, financed by a $115,000 grant from the state, has been established at the University of Minnesota Hospitals. The new unit will operate chiefly as a diagnostic center for the study of children with severe mental and emotional disturbances.

Pathological Conferences.—The Minnesota Department of Health has initiated pathological conferences on cancer and heart disease as a part of regular hospital staff meetings, a departure from its more formal seminars. The conference is led by a guest consultant who reviews case histories of typical cancer and heart patients. Slides, x-ray films, and mimeographed material are presented. The conferences are sponsored by the Minnesota Medical Association, University of Minnesota School of Medicine, Minnesota Cancer Society, Minnesota Heart Association, and the Minnesota Department of Health.

Society News.—At a recent meeting the Minneapolis Surgical Society inducted the following officers: Dr. Hamlin A. Mattson, president, Dr. Robert J. Tenner, vice-president, Dr. Nathan C. Plimpton, secretary, Dr. Horace G. Scott, treasurer, and Dr. Albert T. Hays, recorder. Dr. Charles B. Puestow, clinical professor of surgery, University of Illinois, Chicago, addressed the society on "Surgical Treatment of Carcinoma of the Esophagus and Stomach," and Dr. Virgil J. Lundquist, Minneapolis, on "Pancreatitis Following Drainage of the Common Duct."—— At the annual meeting of the Southern Minnesota Medical Association at Austin, Dr. Helmer J. Nilson, North Mankato, was chosen president, Drs. William C. Bernstein, St. Paul, and David P. Anderson, Austin, first and second vice-presidents, respectively, and Dr. Charles F. Stroebel, Rochester, was reelected secretary-treasurer. Dr. John P. Dahlstet, Mankato, was awarded a medallion for making the outstanding case report, one dealing with Friedländer's pneumonia. The outstanding scientific paper was presented by Dr. Laurence M. Hammar, Mankato, on the treatment of cutaneous malignancies.

MISSISSIPPI

State Medical Election.—The Mississippi State Medical Association, at its annual meeting in Jackson, installed Dr. G. Lamar Arrington, Meridian, president, and elected Dr. Monterville Q. Ewing, Amory, president-elect; Dr. George E. Twente, Jackson, secretary; and Mr. Rowland B. Kennedy, Jackson, executive secretary.

Dr. Boswell Honored.—Dr. Henry Boswell, superintendent of the Mississippi State Tuberculosis Sanatorium for 35 years, was honored at the annual homecoming day ceremonies at the sanatorium. Dr. Boswell's portrait will be hung in the sanatorium, which he helped to found. Dr. Boswell, who is a past president of the Mississippi State Medical Association, has also served as president of the National Tuberculosis Association, the American Sanatorium Association, and the state hospital association.

MISSOURI

St. Louis Forum.—The St. Louis Medical Forum announces the following meetings, which will be held in the St. Louis Medical Society Auditorium at 8 p. m. on the dates given:

Dec. 11, Tuberculosis—No. 1 Threat to the Family.
Jan. 8, 1953, Psychosomatic Ills and "Nervous" Diseases.
Feb. 12, Overweight and High Blood Pressure.

Personal.—Dr. Vincent T. Williams, Kansas City, has accepted appointment as editor of the *Missouri State Medical Association Journal*, effective Jan. 1, 1953.——Dr. James R. Amos, Springfield, has been named by Governor Smith as director of the Missouri State Division of Health to fill the vacancy caused by the death of the late Dr. Buford G. Hamilton. Dr. Amos has been director of the Greene County Health Department since 1941.

Meeting on Cancer.—The next meeting of the consulting staff at the Ellis Fischel State Cancer Hospital in Columbia Dec. 7, at 11 a. m., is open to all members of the medical profession. The following program will be presented:

Prognostic Significance of the I V Pyelogram in Cancer of the Cervix, William T. Moss, St. Louis.
Malignant Melanoma, Charles Staley, Columbia.
Selection of Far Advanced Cancer Patients for Roentgentherapy, James O'Donoghue, St. Joseph.

NEW HAMPSHIRE

Hospital News.—The staff and trustees of Frisbie Memorial Hospital, Rochester, sponsored a dinner meeting at which Dr. Frederick T. Hill, medical director of Thayer Hospital, Waterville, Me., spoke on "The Medical Audit." Invited guests included staff members and trustees of Wentworth Hospital, Dover, Exeter Hospital, Exeter, Huggins Hospital, Wolfeboro, and the Henrietta D. Goodall Hospital, Sanford, Me.

State Medical Election.—At its annual meeting in Bretton Woods the New Hampshire Medical Society installed Dr. Joseph N. Friborg, Manchester, president and chose Dr. Albert E. Barcomb, Rochester, president-elect, Dr. Raymond H. Marcotte, Nashua, vice-president, and Dr. Deering G. Smith, Nashua, secretary and treasurer. The combined meeting of the New Hampshire and Vermont state medical societies will be held at the Equinox House, Manchester, Vt., Oct. 4-6, 1953.

NEW JERSEY

Symposium on Hypertension.—The New Jersey Chapter of the American Academy of General Practice will hold its first annual scientific session, Dec. 13, 1 p. m., at the Essex House, Newark. The following speakers will present a "Symposium on Hypertension":

Arthur C. Corcoran, Cleveland, Etiology, Diagnosis, and Classification.
Kermit L. Pines, New York, Predisposing Causes.
Melvin W. Thorner, Philadelphia, Psychosomatic Aspects.
Charles A. Poindexter, New York, Diagnostic Aids.
Robert S. Palmer, Boston, Therapy.

NEW YORK

Foot Problems in Children.—On Dec. 9 at 6 p. m. Dr. Frederick Lee Liebolt, attending surgeon in charge of orthopedics, New York Hospital, will address the Montgomery County Medical Society at the Elks' Club, Amsterdam, on "Foot Problems in Children."

Lecture on Hyperthyroidism.—On Dec. 15 at 8:30 p. m. Dr. Thomas H. McGavack, professor of clinical medicine, New York Medical College, Flower and Fifth Avenue Hospitals, will deliver an address on "Recent Trends in the Management of the Diseases of Hyperthyroidism" at the Belhurst, Geneva.

Alcoholics Anonymous.—On Dec. 17 at 11 a. m. the staff conference of High Point Hospital, Port Chester, will consider "The Psychodynamics of Alcoholics Anonymous." Round-table discussion will include Dr. Ruth Fox, Dr. James Shea, Dr. Arnold Z. Pfeffer, New York, and the leader, Dr. Harry M. Tiebout, Greenwich, Conn., president of the National Committee on Alcoholism. All members of the profession are invited.

Meeting of Anesthesiologists.—The New York State Society of Anesthesiologists announces that its sixth annual Postgraduate Assembly in Anesthesiology will be held Dec. 10-13 at the Hotel New Yorker. The scientific sessions will include the following:

Obstetric Anesthesia, Virginia Apgar, New York.
Instruments of Medical Measurement, Albert Faulconer, Rochester, Minn.
Temperature Regulation, Eugene F. Dubois, New York.
Shock Syndrome—Mechanisms, Ephraim Shorr, New York.
Respiratory Acidosis, Herbert C. Maier, New York.
Considerations in Use of Intravenous Fluids, Henry T. Randall, New York.
Physiological Changes Accompanying Cardiovascular Surgery, George H. Humphreys II, New York.
Artificial Respiration, James L. Whittenberger, Boston.
Jurisprudence in Anesthesiology, Mr. Harry A. Gair and Mr. Emile Z. Berman.

Registration forms may be obtained from the New York State Society of Anesthesiologists, 137 W. 11th St., New York 11.

New York City

Hospital News.—Montefiore Hospital is presenting a series of conferences at 3 p. m. on the first and third Fridays of each month. Guest speakers on Dec. 5 were Dr. John J. Conley, chief of head and neck service, St. Vincent's Hospital, who spoke on "Management of Carotid Artery Excision in the Treatment of Tumors of the Head and Neck," and Dr. Joseph J. McDonald, director of the surgical service at Francis Delafield Hospital, who discussed "Integration and Timing of Reconstruction Surgery in the Management of Head and Neck Neoplasm." The conference on Dec. 19 will be devoted to presentation of cases with discussion by the hospital staff.

Meetings on Cancer.—"Cancer of the Stomach" was the topic presented by the New York Cancer Society at its meeting, Dec. 2, when Dr. Frank H. Lahey, Lahey Clinic, Boston, spoke on "A More Aggressive Approach to the Surgical Management of Gastric Cancer" and Dr. Owen H. Wangensteen, University of Minnesota Medical School, Minneapolis, considered the question "How Can the Present Accomplishments in Cancer of the Ali-

mentary Tract be Improved?" These papers were discussed by Dr. George T. Pack, Memorial Center for Cancer and Allied Diseases, and Dr. Paul C. Swenson, Jefferson Medical College of Philadelphia. On Jan. 6, 1953, at 8:30 p. m. the society will meet in the New York Academy of Medicine, Fifth Ave. and 103rd St., to investigate "Recent Trends in Radiation Treatment." The following program will be given:

Edith H. Quimby, M.A., New York, Physical Aspects of High Energy Radiation.

Roger A. Harvey, Chicago, Experience with the Betatron in Treatment of Cancer.

Milton Friedman, New York, Concepts of Radical Irradiation of Cancer.

Dr. Douglas Quick, Roosevelt Hospital, New York, and Dr. William Harris, Mount Sinai Hospital, New York, will discuss the papers.

Personal.—Dr. Abner Wolf, professor of neuropathology, Columbia University College of Physicians and Surgeons, has received the annual United Cerebral Palsy Max Weinstein award for achievement in the field of cerebral palsy. The $1,000 award and a plaque were given to Dr. Wolf for his experimental work on the area of prenatal damage as a factor of subsequent cerebral palsy.——Dr. Alton A. Smahl of the New York City Health Department has obtained a leave of absence to accept a two year appointment from the United Nations World Health Organization as public health specialist for Asia and the Middle East, for the control and eradication of the treponemal infections. He will be stationed in Teheran, Iran.——Dr. Arthur C. DeGraff has resigned from the board of trustees of the United States Pharmacopeial Convention in order to accept appointment on the committee of revision, succeeding the late Dr. William T. Salter. Before his election to the board of trustees, Dr. DeGraff had been a member of the committee of revision during the 1940-1950 decade. Dr. DeGraff, who is the Samuel A. Brown professor of therapeutics at the New York University College of Medicine, is visiting physician at Bellevue Hospital and attending physician at the University Hospital of the New York University-Bellevue Medical Center.

NORTH CAROLINA

Society News.—The North Carolina Urological Association has elected Dr. Edwin P. Alyea of Durham, president; Dr. John S. Rhodes of Raleigh, vice-president; and Dr. Louis C. Roberts of Durham, secretary-treasurer.

Narcotic Violation.—Dr. Joseph Augustus Allen, New London, pleaded *nolo contendere* to an indictment charging violation of the Federal Narcotic Law in the U. S. District Court at Salisbury. On Oct. 20 his sentence of two years was suspended and he was placed on probation for a period of three years. He was also fined $500.

OHIO

New Rehabilitation Center.—A rehabilitation center was recently opened at Ohio State University, Columbus, with Dr. Ralph E. Worden as director. A budget of $300,000 was authorized by the Ohio legislature for the center's first two years of operation. The object of the center is to restore handicapped persons to wage-earning capacity. Any person disabled by an industrial accident is eligible for free services, which will include medical care, physical training, and vocational aid. Labor and management representatives make up a six man advisory board for the center, which is a unit of the Ohio State University Health Center.

University News.—The University of Cincinnati College of Medicine announces that grants totaling more than $61,000 have been received from the Army Surgeon General's Office. A $31,976 grant finances a study of gas gangrene, which has been undertaken by the departments of surgery and biological chemistry under the direction of Dr. William A. Altemeier, professor of surgery, and Milan A. Logan, Ph.D., professor of biological chemistry. Dr. Altemeier is a member of the National Research Council and its subcommittees on shock and burns. Under a separate $29,095 grant, studies are being conducted on new methods in treating burns. The National Research Council, sponsor of the grants, has enlisted the further aid of the university's department of surgery in finding substitutes for blood and plasma. Dr. Paul I. Hoxworth, assistant professor of surgery at the university, is in charge of the blood procurement program for the university and the hospital and is aiding in the blood substitute program.

OKLAHOMA

Fifty Year Club.—Dr. John Reynolds of Muskogee, an early day Indian Territory physician and former mayor of Muskogee, received a 50 year pin at a recent meeting of the East Central Oklahoma Society. Members of the Sebastian County (Ark.) Medical Society were guests, and the scientific program on "Common Lesions of the Skin" was presented by Dr. Davis W. Goldstein, Fort Smith, Ark.

Personal.—Dr. Chesley M. Martin of Elgin was recently honored at a reception in the Elgin High School gymnasium. Presentations were made of a gold watch and of a silver tea and coffee service bearing the inscription "Dr. and Mrs. C. M. Martin, Elgin, Okla., in appreciation of the many years of faithful service, June 11, 1952, Your Friends."

PENNSYLVANIA

University and Marriage Council Affiliate.—An affiliation in which the Marriage Council of Philadelphia, an agency devoted to the improvement of marriage relations and offering service to those who wish to be more adequately prepared for marriage, becomes identified with the University of Pennsylvania was announced jointly by Mr. Harold E. Stassen, president of the university, and Dr. Kenneth E. Appel, president of the board of directors of the Marriage Council and professor of psychiatry at the university. The university will organize a family study division within the department of psychiatry with the Marriage Council as the operational unit of the new division. Functions of the new division include offering elective courses for medical students; collaboration with the Marriage Council; and the formulation and direction of research in this field. Dr. Appel has been named chairman of an advisory committee consisting of Drs. John M. Mitchell, dean; Frederick H. Allen; Earl D. Bond; John P. Hubbard; William T. Lhamon; Stuart Mudd; Jonathan E. Rhoads; Elizabeth Kirk Rose; Leon J. Saul; Joseph Stokes Jr.; and Julius Wishner, M.A. A substantial grant in support of the new project has been made by the Grant Foundation of New York City.

Pittsburgh

Lectures on Industrial Medicine.—Physicians are invited to attend the course of lectures in industrial medicine given to the senior medical students at the University of Pittsburgh School of Medicine. A one hour lecture is given each Tuesday at 10 a. m. in the lecture room of Elizabeth Steel Magee Hospital. No registration. On Dec. 9 and 16 William P. Yant, Ph.D., will discuss gases, vapors, dusts, fumes, and mists.

Scientific Papers by Residents.—The Pittsburgh Academy of Medicine, which traditionally reserves its May meeting for the presentation of scientific papers prepared by residents training in the hospitals of the Pittsburgh area, is inviting residents to submit titles of papers for the meeting of May 12, 1953. Titles should be accompanied by a brief abstract and should be sent not later than Feb. 1, 1953, to Dr. Campbell Moses, chairman, program committee, Pittsburgh Academy of Medicine.

Personal.—After 40 years in food research and technology and in the control of foods at municipal, state, and federal levels, Frederick C. Blanck, Ph.D., retired Oct. 1 as administrative fellow in charge of multiple fellowships on food varieties, sustained at Mellon Institute, Pittsburgh, by H. J. Heinz Company. ——Dr. Thomas Parran, dean of the Graduate School of Public Health, University of Pittsburgh, recently delivered the 67th Mary Scott Newbold lecture on "The Doctor of the Future" at the College of Physicians of Philadelphia.

TEXAS

Personal.—San Benito's residents designated Oct. 3 as Dr. Cash Day in honor of Dr. Clarence M. Cash, 88-year-old physician, who has practiced medicine for 54 years. The celebration, sponsored by the city and local civic and service organizations, culminated in the dedication of the new Dr. Cash Elementary School.

Society News.—The Baylor Research Society announces the following 12 o'clock lectures, to be held in room 111 of Baylor University College of Medicine, Houston: Dec. 10, "Serological Studies in Syphilis" by Dr. Wayne Eaton of Jefferson Davis Hospital, and Dec. 17, "Carbon Dioxide Levels in Thoracic Surgery" by Dr. Glace E. Bittenbender of the Veterans Administration Hospital, Houston.

VERMONT

Press Relations Meeting.—The Council of the Vermont State Medical Society has invited the editors of the daily newspapers of Vermont and a representative of the radio stations to dinner and a joint meeting at the Hotel Bardwell, Rutland, Dec. 13. The purpose of this meeting is to ascertain what editors want from the medical profession and to determine how completely these needs can be satisfied without breaking the medical code of ethics.

University News.—Recent appointments to the faculty of the University of Vermont College of Medicine, Burlington, include: Dr. George A. Wolf Jr., New York, professor of clinical medicine; Dr. Howard T. Guare, formerly of Bennington, assistant professor of radiology; Dr. James B. McGill, St. Johnsbury, instructor in surgery; Dr. Earnest L. Mills, Burlington, instructor in anesthesia; Dr. William H. Johnston, Johnson, instructor in radiology; and Dr. William I. Shea, Boston, instructor in clinical surgery.

WASHINGTON

Society News.—Dr. Anthony F. De Palma, Philadelphia, will address the Academy of General Practice at the Spokane Hotel, Dec. 13. All members of the county medical society and those in the adjacent territories are invited.

GENERAL

Gold Keys to Gastroenterologists.—At its 20th anniversary in New York, the National Gastroenterological Association awarded gold keys to the following past presidents in recognition of their services: Drs. Isidor L. Ritter, G. Randolph Manning, Anthony Bassler, New York; William R. Morrison, Boston; Horace W. Soper, St. Louis; William W. Lermann, Pittsburgh; and Clarence J. Tidmarsh, Montreal, Canada.

Areas in Need of Physicians.—Physicians interested in beginning practice or those contemplating a change in location may obtain information on areas in need of general practitioners and specialists that has been compiled by Dr. Leslie A. Falk, Pittsburgh, medical director of United Mine Workers. This information is available at the office of the UMW Welfare and Retirement Fund, Granite Bldg., Pittsburgh.

Southern Surgical Meeting.—The annual session of the Southern Surgical Association will be held at the Hollywood Beach Hotel, Hollywood, Fla., Dec. 9-11, under the presidency of Dr. Idys Mims Gage of New Orleans. Forty-four papers will be presented. The presidential address will be delivered Wednesday morning, and the association dinner will be held Wednesday evening at 8 p. m. There will be a handicap golf tournament Tuesday at 1:30 p. m.

Society News.—At the annual meeting of the American Academy of Pediatrics in Chicago, Dr. Philip S. Barba of Philadelphia was chosen president and Dr. Roger L. J. Kennedy of Rochester, Minn., president-elect.——At its meeting in Durham, N. C., the American Academy for Cerebral Palsy chose the following officers: Dr. Arnold Gesell, New Haven, Conn., president; Dr. Meyer A. Perlstein, Chicago, president-elect; and Dr. Harry E. Barnett, Chicago, secretary-treasurer.——At the annual meeting in Chicago, the American Society for the Study of Arteriosclerosis elected Dr. Nelson W. Barker, Rochester, Minn., president; Dr. Russel L. Holman, New Orleans, vice-president; and Dr. O. J. Pollak, Dover, Del., secretary-treasurer. The next annual meeting will be held Nov. 1-2, 1953, at the Hotel Knickerbocker, Chicago. Dr. Louis N. Katz, Michael Reese Hospital, Chicago 16, is program chairman.

Anniversary of Surgical Trade Association.—George Bugbee of Chicago, executive director of the American Hospital Association, and Dr. Madison B. Brown, executive vice-president of Roosevelt Hospital in New York, will be the principal speakers at the semiannual meeting of the American Surgical Trade Association, which is to be held at the Waldorf-Astoria Hotel, New York, Dec. 14-17. The organization, which has its headquarters at 176 W. Adams St., Chicago, is celebrating its 50th anniversary this year.

Health Officers' Conference.—In Washington, D. C., Dec. 8-11, the Association of State and Territorial Health Officers will hold its annual meeting under the presidency of Dr. Leroy E. Burney, Indianapolis. Simultaneously, the Conference of the Surgeon General of the Public Health Service and the Chief of the Children's Bureau with the State Health, Mental Health, and Hospital Authorities will be held. The meetings will take place in the Federal Security Building, 4th and Independence Ave., S. W. The association will hold its banquet Wednesday evening, with Dr. Thomas P. Murdock, Meriden, Conn., as principal speaker.

Radiologists Meet in Cincinnati.—The annual meeting of the Radiological Society of North America will be held at the Netherland Plaza Hotel in Cincinnati, Dec. 7-12, under the presidency of Dr. Joseph C. Bell, Louisville. Sixty-one papers will be presented. Forty-four refresher courses have been scheduled for presentation at that hotel and at the Sheraton-Gibson Hotel. On Tuesday at 8:30 p. m. at the Netherland Plaza, Dr. Richard H. Chamberlain, Philadelphia, will deliver the Carman lecture on "The Place of Physics in Clinical Radiology." The registration fee of $15, which includes the refresher course fee, must be paid by all nonmembers of the Radiological Society of North America, with the exception of guest speakers, guest lecturers, residents or fellows in radiology, students, and officers in the armed forces of the United States on temporary duty and away from their practices.

Conference on Trichinosis at A. M. A. Headquarters.—The National Conference on Trichinosis will be held in the auditorium of the American Medical Association, 535 N. Dearborn St., Chicago, Dec. 15-16, under the co-sponsorship of the American Board of Veterinary Public Health, American Medical Association, American Society of Clinical Pathologists, American Veterinary Medical Association, Conference of Public Health Veterinarians, U. S. Public Health Service, and the University of Michigan Phoenix Project. Dr. George F. Lull, Secretary and General Manager, American Medical Association, will deliver the address of welcome at 9:30 a. m. Monday. Presentations by physicians will include:

Trichinosis: A National Problem, Joseph O. Dean, Washington, D. C.
Trichinosis in Man, Sylvester E. Gould, Eloise, Mich.
Research, Education, and Control of Trichinosis, Morris Fishbein, Chicago.

At 3 p. m. the first meeting of working groups will be held to study specific problems and formulate recommendations on public health and control, animal health, economic problems and legislation, education, research, and permanent organization.

Osborne and Mendel Award in Nutrition.—Nominations are invited for the 1952 Osborne and Mendel award of $1,000, established by the Nutrition Foundation Inc. for the recognition of outstanding accomplishments in research in nutrition. The award will be presented at the annual meeting of the institute. If, in the judgment of the jury of award, an injustice would otherwise be done, the award may be divided among two or more persons. Normally preference will be given to research workers in the United States and Canada; but investigators in other countries,

especially those sojourning in the United States or Canada for some time, are not excluded. There is no limitation as to age. Nominations may be made by anyone. Nominations for the 1952 award, accompanied by data relative to the accomplishments of the nominee, must be sent before Jan. 1, 1953, to the chairman of the nominating committee, Philip Handler, Ph.D., department of biochemistry, Duke University School of Medicine, Durham, N. C.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories, and possessions in the weeks ended as indicated:

Area	Nov. 15, 1952	Nov. 8, 1952	Nov. 17, 1951
New England States			
Maine	7	2	1
New Hampshire	1	2	..
Vermont	1	5	2
Massachusetts	2	9	1
Rhode Island	4	6	..
Connecticut	3	11	2
Middle Atlantic States			
New York	63	50	15
New Jersey	11	19	13
Pennsylvania	32	27	18
East North Central States			
Ohio	57	50	17
Indiana	21	43	11
Illinois	48	95	32
Michigan	67	91	18
Wisconsin	15	57	22
West North Central States			
Minnesota	88	116	6
Iowa	44	50	9
Missouri	25	47	18
North Dakota	3	16	2
South Dakota	19	29	2
Nebraska	24	34	10
Kansas	24	30	18
South Atlantic States			
Delaware	..	2	1
Maryland	2	5	5
District of Columbia	..	..	..
Virginia	10	11	4
West Virginia	7	14	16
North Carolina	12	4	1
South Carolina	1	5	3
Georgia	16	6	9
Florida	18	18	7
East South Central States			
Kentucky	29	24	4
Tennessee	10	14	16
Alabama	6	3	4
Mississippi	8	3	26
West South Central States			
Arkansas	2	8	7
Louisiana	6	4	6
Oklahoma	15	21	19
Texas	17	23	44
Mountain States			
Montana	9	7	3
Idaho	15	12	3
Wyoming	7	14	4
Colorado	22	11	8
New Mexico	7	1	3
Arizona	14	10	6
Utah	12	31	13
Nevada	13	7	1
Pacific States			
Washington	18	37	13
Oregon	13	24	14
California	202	167	116
Territories and Possessions			
Alaska	7	12	..
Hawaii	1	1	1
Puerto Rico	..	3	1
Total	1,058	1,291	575

PUERTO RICO

Medical Association Meeting.—The Medical Association of Puerto Rico will hold its annual meeting Dec. 10-14 in Santurce under the presidency of Dr. Luis A. Sanjurjo. The following physicians will be guests of honor: Garfield G. Duncan, Charles P. Bailey, and Isaac Starr, Philadelphia; Carl A. Moyer, St. Louis; Oscar Swineford Jr., Charlottesville, Va.; Paul H. Holinger, Chicago; Ralph V. Platou, New Orleans; Charles C. Higgins, Cleveland; Karl A. Menninger, Topeka, Kan.; Thomas D. Moore, Memphis, Tenn.; Reed M. Nesbit, Ann Arbor, Mich.; José Roberto Vivas, San Antonio, Texas; C. Langdon Parsons, Chapel Hill, N. C.; and Arthur C. Allen, New York. Symposiums will be held on "The Clinical Significance of Hematuria," "Carcinoma of the Uterus," "Schistosomiasis Mansoni," and "Infantile Diarrhea."

LATIN AMERICA

Poliomyelitis Clinic.—Central America's first poliomyelitis clinic, a 50 bed hospital, was recently opened in Guatemala City.

Mexican Congress on Tuberculosis and Silicosis.—The fifth Mexican National Congress of Tuberculosis and Silicosis will take place in Guadalajara, Jalisco, Jan. 25-31, 1953, at the School of Medicine of the University of Guadalajara under the auspices of the government of the State of Jalisco and the University of Guadalajara.

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, June 23-25. Sec., Dr. D. G. Gill, 537 Dexter Ave., Montgomery.

ALASKA:* *Examination.* Juneau, March 3. On application in other towns where there are board members. *Reciprocity.* On application. Sec., Dr. W. M. Whitehead, Box 140, Juneau.

COLORADO:* *Examination.* Denver, Jan. 13-16. Exec. Sec., Mrs. B. H. Hudgens, 831 Republic Bldg., Denver.

DELAWARE: *Examination.* Dover, Jan. 13-15. *Reciprocity.* Dover, Jan. 22. Sec., Dr. J. S. McDaniel, 229 South State St., Dover.

GUAM: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Ex. Sec., Dr. Austin W. Matthis, Agana.

HAWAII: Honolulu, Jan. 12-14. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

IDAHO: Boise, Jan. 12-14. Sec., Mr. Armand L. Bird, 364 Sonna Bldg., Boise.

INDIANA: *Examination.* Indianapolis, June 23-25. Ex. Sec., Miss Ruth V. Kirk, 538 K of P Bldg., Indianapolis.

IOWA:* *Examination.* Des Moines, Dec. 8-10. Acting Director, Dr. Walter L. Bierring, State Office Bldg., Des Moines.

KANSAS: Topeka, Dec. 10-11. Sec., Dr. O. W. Davidson, 864 New Brotherhood Bldg., Kansas City.

KENTUCKY: *Examination.* Louisville, Dec. 8-10. Sec., Dr. Bruce Underwood, 620 S. 3rd St., Louisville.

MARYLAND: *Examination.* Baltimore, Dec. 9-12. Sec., Dr. Lewis P. Gundry, 1215 Cathedral St., Baltimore 1.

MASSACHUSETTS: *Examination.* Boston, Jan. 13-16. Sec., Dr Robert C. Cochrane, Room 37, State House, Boston.

MISSISSIPPI: *Reciprocity.* Jackson, December. Asst. Sec., Dr. R. N. Whitfield, State Board of Health, Jackson 113.

NEBRASKA:* *Examination.* Omaha, June 1953. Director, Mr. Husted K. Watson, Room 1009 State Capitol Bldg., Lincoln 9.

NORTH CAROLINA. *Reciprocity.* Winston Salem, Jan. 19. Sec., Dr. Joseph J. Combs, 716 Professional Bldg., Raleigh.

NORTH DAKOTA: *Examination.* Grand Forks, Jan. 7-9. *Reciprocity.* Grand Forks, Jan. 10. Sec., Dr. C. J. Glaspel, Grafton,

OKLAHOMA:* *Examination.* Oklahoma City, June 10-11. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

OREGON:* *Examination.* Portland, Jan. 5-6. Exec. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland.

PENNSYLVANIA: *Examination.* Philadelphia, January. Acting Sec., Mrs. Marguerite G. Steiner, Box 911, Harrisburg.

SOUTH DAKOTA:* Sioux Falls, Jan. 20-21. Exec. Sec., Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.

UTAH: *Examination.* Salt Lake City, July. Asst. Dir., Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City.

VIRGINIA: *Examination.* Richmond, Dec. 11-13. *Reciprocity.* Richmond, Dec. 10. Sec., Dr. K. D. Graves, 631 First St., S.W., Roanoke, Va.

WISCONSIN: *Examination.* Madison, January 13-15. Sec., Dr. A. G. Koehler, 46 Washington Blvd., Oshkosh.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ALASKA: *Examination.* On application. Juneau or other towns in Territory as decided by Board. *Reciprocity.* On application. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

OKLAHOMA: Oklahoma City, April 3. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

OREGON: *Examination.* Portland, Dec. 6. Sec., Dr. Charles D. Byrne, State Board of Higher Education, University of Oregon, Eugene.

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

1953 Annual Session, New York, June 1-5.

1953 Clinical Session, St. Louis, Dec. 1-4.

1954 Annual Session, San Francisco, June 21-25.

1954 Clinical Session, Miami, Florida, Nov. 30-Dec. 3.

ANNUAL CONGRESS ON INDUSTRIAL HEALTH, Drake Hotel, Chicago, Jan. 20-22. Dr. Carl M. Peterson, 535 N. Dearborn St., Chicago 10, Secretary.

AMERICAN ACADEMY OF DERMATOLOGY AND SYPHILOLOGY, Palmer House, Chicago, Dec. 6-11. Dr. John E. Rauschkolb, P.O. Box 6565, Cleveland 1, Secretary.

AMERICAN ACADEMY OF OBSTETRICS AND GYNECOLOGY, Palmer House, Chicago, Dec. 15-17. Dr. Ralph A. Reis, 116 S. Michigan Blvd., Chicago 3, Secretary.

AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY:

EASTERN SECTION, Hotel Syracuse, Syracuse, N. Y., Jan. 7. Dr. Francis W. Davison, Danville, Pa., Chairman.

MIDDLE SECTION, Drake Hotel, Chicago, Jan. 19. Dr. Ralph J. McQuiston, 20 North Meridian St., Indianapolis 4, Chairman.

SOUTHERN SECTION, Andrew Jackson Hotel, Nashville, Tenn., Jan. 12. Dr. Lester A. Brown, 490 Peachtree St., N.E., Atlanta 3, Ga., Chairman.

WESTERN SECTION, Elks Club, Los Angeles, Jan. 24. Dr. Howard P. House, 1136 West Sixth St., Los Angeles 14, Chairman.

ASSOCIATION FOR RESEARCH IN NERVOUS AND MENTAL DISEASES, Hotel Roosevelt, New York, Dec. 12-13. Dr. Clarence C. Hare, 700 West 168th St., New York 32, Secretary.

ASSOCIATION OF STATE AND TERRITORIAL HEALTH OFFICERS, Washington, D. C., Dec. 8-11. Dr. John D. Porterfield, 306 Ohio Depts. Bldg., Columbus 15, Ohio, Secretary.

INTERNATIONAL POST-GRADUATE MEDICAL ASSEMBLY OF SOUTHWEST TEXAS, Municipal Auditorium, San Antonio, Texas, Jan. 27-29. Dr. John M. Smith Jr., P. O. Box 2445, San Antonio 6, Texas, Secretary.

NORTHWEST SOCIETY FOR CLINICAL RESEARCH, Seattle, Jan. 16-17. Dr. Arthur L. Rogers, 1216 S.W. Yamhill St., Portland 5, Ore., Secretary.

PUERTO RICO MEDICAL ASSOCIATION, Santurce, Dec. 10-14. Dr. Luis R. Guzman-Lopez, Box 9111, Santurce, Secretary.

RADIOLOGICAL SOCIETY OF NORTH AMERICA, Netherland Plaza and Sheraton-Gibson Hotels, Cincinnati, Dec. 7-12. Dr. Donald S. Childs, 713 East Genesee St., Syracuse 2, N. Y., Secretary.

SECTIONAL MEETINGS, AMERICAN COLLEGE OF SURGEONS:

CINCINNATI, The Netherland Plaza, Jan. 19-21. Dr. M. M. Zinninger, Cincinnati General Hospital, Cincinnati 29, Chairman.

SOUTHERN SURGICAL ASSOCIATION, Hollywood, Fla., Dec. 9-11. Dr. John C. Burch, 2112 West End Ave., Nashville 5, Tenn., Secretary.

WESTERN SOCIETY FOR CLINICAL RESEARCH, Carmel, Calif., Jan. 30-31. Herbert N. Hultgren, Stanford Hospital, San Francisco 15, Secretary.

INTERNATIONAL

CONGRESS OF INTERNATIONAL LEAGUE AGAINST RHEUMATISM, Geneva and Zurich, Switzerland, Aug. 24-29, 1953. For information write: Dr. W. Tegner, The London Hospital, London E.1, England.

CONGRESS OF THE INTERNATIONAL SOCIETY OF SURGERY, Lisbon, Portugal, Sept. 15-20, 1953. Dr. L. Dejardin, 141, rue Belliard, Brussels, Belgium, General Secretary.

INTER-AMERICAN SESSION, AMERICAN College of Surgeons, Paulista Medical Association Bldg., Sao Paulo, Brazil, Feb. 9-12, 1953. Dr. Moacyr Eyck Alvaro, 1151 Conselacao, Sao Paulo, Brazil, Chairman.

INTERNATIONAL CONGRESS OF AUDIOLOGY, Groningen, Netherlands, June 5-6, 1953. Dr. Gunnar Holmgren, Strandvagen 5A, Stockholm, Sweden, President.

INTERNATIONAL CONGRESS OF ELECTROENCEPHALOGRAPHY AND CLINICAL NEUROPHYSIOLOGY, Boston, Mass., U. S. A., Aug. 18-21, 1953. Dr. Robert S. Schwab, Massachusetts General Hospital, Boston 14, Mass., U. S. A., Secretary-General.

INTERNATIONAL CONGRESS FOR HISTORY OF SCIENCE, Jerusalem, Israel, August 3-7, 1953. Prof. F. S. Bodenheimer, Hebrew University, Jerusalem, Israel, President.

INTERNATIONAL CONGRESS ON MEDICAL LIBRARIANSHIP, London, England, July 20-25, 1953. Mr. W. R. LeFanu, % London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1, England, Chairman.

INTERNATIONAL CONGRESS OF MICROBIOLOGY, Rome, Italy, Sept. 6-12, 1953. For information write: Dr. V. Puntoni, Citta Universitaria, Rome, Italy.

INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY, Montevideo, Uruguay, March 1-7, 1953. Dirreccion General del Servico de Sanitad Militar, 8 de Octubre y Mariano Moreno, Montevideo, Uruguay, Secretariat of the Congress.

INTERNATIONAL CONGRESS OF OTORHINOLARYNGOLOGY, Amsterdam, Netherlands, June 8-15, 1953. Dr. W. H. Struben, J. J. Viottastraat 1, Amsterdam, Netherlands, Secretary.

INTERNATIONAL CONGRESS OF PAEDIATRICS, Havana, Cuba, Oct. 12-17, 1953. Prof. Felix Hurtado, 5a Avenue 124, Miramar, Havana, Cuba, President.

INTERNATIONAL CONGRESS OF RADIO-BIOLOGY, Copenhagen, Denmark, July 14-25, 1953. Prof. Flemming Norgaard, Oster Voldgade 10, Copenhagen K, Denmark, Secretary General.

INTERNATIONAL CONGRESS OF RADIOLOGY, Copenhagen, Denmark, July 19-25, 1953. Professor Flemming Norgaard, 10 Oster Voldgade, Copenhagen K., Denmark, Secretary General.

INTERNATIONAL CONGRESS OF THALASSOTHERAPY, Dubrovnick, Yugoslavia, May 17-25, 1953. Prof. C. Plavaic, Mavrodne Republick 51, Belgrade, Yugoslavia, Secretary General.

INTERNATIONAL CONGRESSES OF TROPICAL MEDICINE AND MALARIA, Istanbul, Turkey, Aug. 28-Sept. 4, 1953. Professor Dr. Ihsan Sükrü Aksel, Tunel Meydam, Beyoglu, Istanbul, Turkey, General Secretary.

INTERNATIONAL FERTILITY ASSOCIATION, New York, N. Y., U. S. A., May 25-31, 1953. Dr. Abner I. Weisman, 1160 Fifth Avenue, New York 29, N. Y., U. S. A., Associate Secretary General.

INTERNATIONAL HOSPITAL CONGRESS, London, England, May 25-30, 1953. Capt. J. E. Stone, 10 Old Jewry, London, EC2, England, Hon. Secretary.

INTERNATIONAL LEPROSY CONGRESS, Madrid, Spain, Oct. 3-10, 1953. Dr. Felix Contreras, Moreto 15, Madrid, Spain, Secretary.

INTERNATIONAL PHYSIOLOGICAL CONGRESS, Montreal, Canada, Aug. 31-Sept. 4, 1953. Dr. A. S. V. Burgen, Dept. of Physiology, McGill University, Montreal, Canada, Secretary.

INTERNATIONAL UNION AGAINST CANCER AND INTERNATIONAL CANCER RESEARCH COMMISSION, Joint Meeting, Bombay, India. Dec. 28. Prof. Khanolkar, Tata Memorial Hospital. Bombay, India, President.

INTERNATIONAL VETERINARY CONGRESS, Stockholm, Sweden, Aug. 9-15, 1953. Prof. Axel Isaksson, Institute of Veterinary Medicine, Stockholm 50, Sweden, Secretary.

PAN AMERICAN CONGRESS OF THE MEDICAL PRESS, Buenos Aires, Argentine, July 12-16, 1953. Secretaria del Congress, 763 Uriburu, Buenos Aires, Argentine.

PAN AMERICAN MEDICAL ASSOCIATION, International Medical Cruise Congress, S. S. Nieuw Amsterdam, Jan. 7-19. Executive Offices, 745 Fifth Ave., New York 22, N. Y.

WORLD CONFERENCE ON MEDICAL EDUCATION, British Medical Association House, Tavistock Square, W.C.1, London, England, Aug. 24-29, 1953. Secretariat: World Medical Association, 2 East 103d St., New York 29, N. Y., U. S. A.

WORLD CONGRESS OF THE WORLD CONFEDERATION FOR PHYSICAL THERAPY, London, England, Sept. 7-12, 1953. Miss M. J. Neilson, Chartered Society of Physiotherapy, Tavistock House, South, Tavistock Square, London, W.C.1, England, Secretary.

DEATHS

Chetwood, Charles Howard ✠ Brooklyn; born in Elizabeth, N. J., Oct. 10, 1869; Bellevue Hospital Medical College, New York, 1887; specialist certified by the American Board of Urology; an Associate Fellow of the American Medical Association; member of the American Association of Genito-Urinary Surgeons and American Urological Association; fellow of the American College of Surgeons; past president of the Medical Society of the County of New York; at one time professor of urologic surgery at New York Polyclinic Medical School and Hospital; author of "Practice of Urology" and other publications; served as consulting urologist at St. John's Long Island City Hospital in Long Island City, Knickerbocker Hospital in New York City, White Plains and St. Agnes hospitals in White Plains, and Nassau Hospital in Mineola; from 1920 to 1949 director of urology, French Hospital, New York City, where he died Oct. 15, aged 82, of arteriosclerotic heart disease.

Lloyd, Henry Demarest ✠ Little Compton, R. I.; Harvard Medical School, Boston, 1904; member of the Massachusetts Medical Society; once president of the New England Dermatological Society; for two terms state senator; formerly on the faculty of his alma mater; chairman of the school committee; for many years affiliated with the Massachusetts General Hospital in Boston; in 1947 retired as a member of the board of directors of the *Chicago Tribune;* formerly director of the *Daily News* in New York; died in the Faulkner Hospital in Boston Nov. 3, aged 74, following an operation for intestinal obstruction.

Lovelady, Sim Bedford ✠ Houston, Texas; born in Danville, Ala., Jan. 11, 1909; Tulane University of Louisiana School of Medicine, New Orleans, 1934; assistant professor of clinical obstetrics and gynecology at Baylor University College of Medicine; member of the Central Association of Obstetricians and Gynecologists; fellow of the Royal Society of Medicine of England; specialist certified by the American Board of Obstetrics and Gynecology; served during World War II; formerly member of the staff of Mayo Clinic in Rochester, Minn.; died Oct. 8, aged 43, of myocardial infarction.

Allison, Thomas Pinckney, Sand Springs, Okla.; St. Louis College of Physicians and Surgeons, 1899; died in Tulsa Aug. 1, aged 81, of septicemia and bronchopneumonia.

Bampfield, Fred James, Baltimore; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1917; member of the American Society of Anesthesiologists; affiliated with Maryland General, St. Agnes, and St. Joseph's hospitals; died Sept. 20, aged 60, of coronary thrombosis.

Bentley, George Andrew, Detroit; University of Toronto Faculty of Medicine, Toronto, Canada, 1918; affiliated with Saratoga General Hospital; died Sept. 4, aged 59, of coronary disease and rheumatoid arthritis.

Bier, Paul Decker, Pittsburgh; Hahnemann Medical College and Hospital of Philadelphia, 1921; died Sept. 24, aged 61, of diabetes mellitus.

Buelow, Robert C., Milwaukee; Milwaukee Medical College, 1897; died in Wauwatosa Sept. 27, aged 77, of carcinomatosis.

Canfield, Harry Eugene ✠ Fort Lauderdale, Fla.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1906; veteran of the Spanish-American War and World War I; formerly practiced in Rockford, Ill., where he was affiliated with the Swedish American Hospital; died in Coral Gables, Fla., Sept. 30, aged 76, of coronary occlusion and nephrosclerosis.

Chandler, Charles Porter ✠ Montpelier, Vt.; Columbia University College of Physicians and Surgeons, New York, 1913; member of the New England Obstetrical and Gynecological Society; president of the New England Surgical Society; fellow of the American College of Surgeons, of which he was a governor; served during World War I; affiliated with Heaton Hospital; died in Stockbridge, Mass., Sept. 19, aged 64, of coronary disease.

Cremer, Victor Henry, Tomah, Wis.; Marquette University School of Medicine, Milwaukee, 1928; died recently, aged 57, of coronary heart disease.

Dionne, Ulric Albany ✠ Waterbury, Conn.; Tufts College Medical School, Boston, 1930; certified by the National Board of Medical Examiners; served during World War II; died in Milford Aug. 27, aged 47, of coronary disease.

Downs, Maggie Yelton ✠ Danville, Ill.; Keokuk (Ia.) Medical College, 1893; served on the staff of the Lake View Hospital, where she died Sept. 23, aged 84, of congestive heart failure.

Elinor, Talmai Zethor, Greenfield, Tenn.; University of the South Medical Department, Sewanee, 1901; died Sept. 1, aged 77, of hypertensive cardiovascular disease.

Ely, Francis Argyle ✠ Des Moines, Iowa; State University of Iowa College of Medicine, Iowa City, 1898; specialist certified by the American Board of Psychiatry and Neurology; member and formerly vice-president of the Central Neuropsychiatric Association; past president of the Polk County Medical Society; formerly professor of neurology and clinical neurology at Drake University College of Medicine; author of "Lights and Shadows in the Life of a Doctor"; on the staff of the Iowa Methodist Hospital, where he died Sept. 25, aged 76, of bronchopneumonia.

Fawcett, Arthur Jesse, Grants Pass, Ore.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1909; died in Veterans Administration Hospital, Roseburg, Sept. 11, aged 79.

Fogg, Allston Lincoln, Bradenton, Fla.; College of Physicians and Surgeons, Boston, 1906; served during World Wars I and II; for many years practiced in Burlington, Vt., where he was a member of the staffs of the Mary Fletcher, Bishop DeGoesbriand, and Fanny Allen hospitals; died in Folkstone, Ga., Sept. 25, aged 67.

Geringer, Richard Connell, Dayton, Ohio; University of Cincinnati College of Medicine, 1916; served during World War I; died in Veterans Administration Hospital, Dayton, recently, aged 61, of hypertensive cardiovascular disease and cirrhosis of the liver.

Grant, John Evans, Lewiston, Maine; University of Buffalo School of Medicine, 1948; certified by the National Board of Medical Examiners; formerly resident surgeon in ear, nose, and throat at Boston City Hospital; died in Central Maine General Hospital Sept. 2, aged 29.

Guensberg, Marcus ✠ Kaneohe, Hawaii; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1925; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; medical director of the Territorial Hospital; formerly psychiatrist at Manhattan State Hospital in New York; died recently, aged 52.

Gunzenhauser, Isidor Hermann ✠ Whitestone, N. Y.; Julius-Maximilians-Universität Medizinische Fakultät, Würzberg, Bavaria, Germany, 1910; affiliated with Flushing Hospital and Parsons Hospital, where he died Sept. 28, aged 66, of embolism following an operation.

Harris, Eva Lillian ✠ Oakland, Calif.; Hahnemann Medical College of the Pacific, San Francisco, 1895; an Associate Fellow of the American Medical Association; died in French Hospital, San Francisco, recently, aged 83, of carcinoma of the breast with metastases.

Hartzo, James Daniel ✠ McLeod, Texas (licensed in Texas under the Act of 1907); died in Atlanta recently, aged 83, of uremia.

✠ Indicates Member of the American Medical Association.

Johnson, Leonard Zachariah ✠ Washington, D. C.; Howard University College of Medicine, Washington, 1932; member of the Medical Society of the State of Pennsylvania; served during World War II: died Sept. 20, aged 44.

Keeler, Elon Theodore, Lamont, Okla.; Northwestern University Medical School, Chicago, 1908; died in St. Mary's Hospital and Annex in Enid, recently, aged 70, of arteriosclerosis and Parkinson's disease.

Kenney, Howard Joseph ✠ Delavan, Wis.; Marquette University School of Medicine, Milwaukee, 1929; member of the American Academy of General Practice; died recently, aged 47, of coronary thrombosis.

Kilpatrick, George Carleton ✠ Mobile, Ala.; Tulane University School of Medicine, New Orleans, 1908; died in Edmonton, Alberta, Canada, recently, aged 69, of myocardial infarction and coronary sclerosis.

Koschalk, Joseph ✠ Brighton, Colo.; State University of Iowa College of Medicine, Iowa City, 1933; certified by the National Board of Medical Examiners; served during World Wars I and II; died Sept. 23, aged 52.

Laidley, Wallace Gilmour ✠ Ogden, Iowa; Queen's University Faculty of Medicine, Kingston, Ontario, Canada, 1906; affiliated with Boone County Hospital in Boone; died Sept. 28, aged 76, of cerebral hemorrhage.

Luckie, Lorenzo Foster ✠ Vero Beach, Fla.; Birmingham Medical College, 1910; veteran of the Spanish-American War; served during World Wars I and II; at one time warden of the penitentiary in Honolulu; formerly affiliated with Veterans Administration Hospital in Montgomery, Ala.; in 1928 awarded the Carnegie hero medal for capturing a desperado; died in the Veterans Administration Hospital in Coral Gables, Sept. 9, aged 76, of pulmonary tuberculosis.

McDonald, Daniel Webster, Quitman, Miss. (licensed in Mississippi in 1926); died Oct. 13, aged 72.

Meese, Lee David ✠ Sutton, Neb.; University of Nebraska College of Medicine, Omaha, 1947; died in St. Elizabeth's Hospital, Lincoln, Aug. 23, aged 29, of anterior poliomyelitis.

Pearlstein, Maurice ✠ New York; University of Oklahoma School of Medicine, Oklahoma City, 1925; died Aug. 22, aged 52.

Pringle, John Tecumseh, Grass Valley, Calif.; Omaha Medical College, 1895; died Sept. 19, aged 84, of arteriosclerotic heart disease and hypertrophy of the prostate.

Reynolds, Oliver R., Advance, Mo.; Barnes Medical College, St. Louis, 1905; died Sept. 10, aged 87, of diabetes mellitus and arteriosclerosis.

Rhodebeck, Edmund Jean, New York; Columbia University College of Physicians and Surgeons, New York, 1920; died in New Orleans Sept. 28, aged 59, of acute myocardial infarction and coronary arteriosclerosis.

Ricker, Samuel Foster ✠ Orlando, Fla.; University of Kansas School of Medicine, Kansas City, Kan., 1925; died in Orange Memorial Hospital Aug. 18, aged 52, of coronary heart disease.

Robbins, Crockett D. ✠ Gallatin, Tenn.; University of Nashville Medical Department, 1907; died Sept. 15, aged 71, of pneumonia.

Rohmer, Frank Joseph, Los Angeles; Memphis (Tenn.) Hospital Medical College, 1903; died recently, aged 80, of cerebral thrombosis and arteriosclerosis.

Rosenfeld, Norman Brown ✠ Clinton, Ind.; St Louis University School of Medicine, 1936; certified by the National Board of Medical Examiners; served during World War II; died Oct. 21, aged 40.

Rossmann, Benny ✠ Brookline, Mass.; Philipps-Universität Medizinische Fakultät, Marburg, Prussia, Germany, 1921; instructor in medicine at Boston University School of Medicine; affiliated with Massachusetts Memorial Hospital; died Sept. 6, aged 59, of coronary thrombosis.

Rumley, James C. ✠ Stigler, Okla.; University of Tennessee Medical Department, Nashville, 1896; died Sept. 11, aged 80, of uremia.

Sanger, Guy Edward ✠ Arlington, Mass.; Harvard Medical School, Boston, 1903; served on the board of health; affiliated with Symmes Arlington Hospital; died Oct. 14, aged 73, of coronary thrombosis.

Santeramo, Remigio, New York; Regia Universita di Napoli Facolta di Medicina e Chirurgia, Italy, 1908; affiliated with Columbus Hospital; died Sept. 17, aged 72, of heart disease.

Schulman, Maximilian ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1905; specialist certified by the American Board of Internal Medicine; at one time on the faculty of his alma mater; formerly physician to the Vanderbilt Clinic; died in the Lenox Hill Hospital Oct. 3, aged 71, of cerebral hemorrhage.

Scott, David Miller, Aiken, S. C.; Tufts College Medical School, Boston, 1916; died in Veterans Administration Hospital, Augusta, Ga., Sept. 14, aged 62.

Sharp, Ethel Hill, Cincinnati, Ohio; Hering Medical College, Chicago, 1900; formerly practiced in Pittsburg, Kan., where she served for one term on the board of education; died Sept. 24, aged 76.

Shaw, Ralph Henry Rothery, Providence, R. I.; University of Glasgow Medical Faculty, Scotland, 1890; served during World War I; died Sept. 10, aged 86.

Shope, Charles Edgar, Altoona, Pa.; Jefferson Medical College of Philadelphia, 1922; served during World War I; affiliated with Mercy Hospital, where he died July 10, aged 55, of uremia and chronic nephritis.

Simon, Sylvia Bennett, New York; Medizinische Fakultät der Universität, Vienna, Austria, 1936; affiliated with Bellevue Hospital; died Oct. 8, aged 43, of cerebral hemorrhage.

Simpson, Samuel Ellis, Savannah, Mo.; John A. Creighton Medical College, Omaha, 1915; served during World War I; died in Missouri Methodist Hospital, St. Joseph, Sept. 5, aged 60, of myocardial infarction.

Sleet, John Cary ✠ Norfolk, Va.; University of Maryland School of Medicine, Baltimore, 1899; served as health officer; died in the Leigh Memorial Hospital Sept. 19, aged 76, of intestinal obstruction.

Smith, Appleton White, New Haven, Conn.; Harvard Medical School, Boston, 1902; served as superintendent of the Hartford (Conn.) Hospital and Garfield Memorial Hospital, Washington, D. C.; died in West Haven Sept. 14, aged 87, of cerebral hemorrhage and arteriosclerosis.

Snypp, Theodore, Clippergap, Calif.; Eclectic Medical Institute, Cincinnati, 1883; for many years health officer of Placer County; died in Sebastopol Sept. 6, aged 92, of chronic interstitial nephritis and cardioventricular arrest.

Stevens, Sandy W., Lorain, Ohio; Western Reserve University Medical Department, Cleveland, 1891; died in St. Joseph's Hospital July 23, aged 91, of arteriosclerotic heart disease.

Stone, James Edward ✠ Hopkinsville, Ky.; Kentucky School of Medicine, Louisville, 1893; affiliated with Jennie Stuart Memorial Hospital, where he died Sept. 14, aged 85, of cerebral hemorrhage.

Terry, Jarvis Russell ✠ Lexington, N. C.; University of Louisville (Ky.) Medical Department, 1911; died Sept. 6, aged 72, of carcinoma.

Textor, Charles Sheridan ✠ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1903; affiliated with St. John's Hospital, where he died Sept. 26, aged 80, of carcinoma of body and tail of pancreas.

Thompson, Charles Edward, Winfield, Texas; University Medical College of Kansas City, Mo., 1897; died Sept. 1, aged 79, of cerebral arteriosclerosis.

Thorpe, Jarvis Loomis ✠ Clyde, N. Y.; Hahnemann Medical College and Hospital of Philadelphia, 1899; health officer of the village of Clyde since 1915, and of the consolidated health district of Galen-Clyde since 1950; on the staff of the Edward J. Barber Hospital in Lyons; died Sept. 6, aged 79.

Toepel, Otto T. ✠ Detroit; Detroit College of Medicine, 1893; died July 19, aged 81, of cardiorenal failure.

Toll, James Leslie, Lawrenceburg, Ky.; Kentucky School of Medicine, Louisville, 1897; past president of the Anderson County Medical Society; formerly mayor; served as a member of the county board of health; died Oct. 7, aged 78, of cerebral hemorrhage.

Trimble, William Kirk ✠ Kansas City, Mo.; Kansas City Medical College, 1900; an Associate Fellow of the American Medical Association; member of the American Society of Clinical Pathologists; past president of the Kansas City Pathological Society; formerly on the faculty of University of Kansas School of Medicine, Kansas City, Kan.; affiliated with Trinity Lutheran, Research, St. Luke's, and Kansas City General hospitals; died, Oct. 4, aged 78, of acute coronary thrombosis.

Urbanowski, Leon Vincent ✠ La Salle, Ill.; St. Louis University School of Medicine, 1917; affiliated with St. Mary's Hospital; died Sept. 18, aged 61, of peritonitis and a ruptured gallbladder.

Van Benschoten, William Crowell ✠ Chicago, Ill.; Northwestern University Medical School, Chicago, 1896; an Associate Fellow of the American Medical Association; surgeon for the Illinois Central Railroad; died in Evanston Oct. 21, aged 82, of bronchopneumonia and Parkinsonism.

Vines, Edward Hellis, Saratoga Springs, N. Y.; Albany (N. Y.) Medical College, 1905; served during World War I; died in Saratoga Springs (N. Y.) Hospital Sept. 27, aged 77, of arteriosclerosis.

Wakefield, Frank Leeper ✠ Heyworth, Ill.; Bellevue Hospital Medical College, New York, 1890; for many years member of the board of health; school director for many years; affiliated with Brokaw and St. Joseph's hospitals in Bloomington; died Sept. 29, aged 85, of bronchopneumonia and arteriosclerosis.

Weaver, C. Hiram ✠ Los Angeles; Indiana University School of Medicine, Indianapolis, 1912; fellow of the American College of Surgeons and the International College of Surgeons; served with the medical corps of the U. S. Navy, 1913-1921; stationed in Spain during World War I; formerly on staff of Presbyterian Hospital-Olmsted Memorial; died Oct. 7, aged 62, of coronary occlusion and atherosclerosis.

Weedman, Walter Franklin ✠ Billings, Mont.; St. Louis University School of Medicine, 1914; affiliated with St. Vincent's Hospital and Deaconess Hospital where he died Sept. 11, aged 72, of cerebral hemorrhage.

Weems, William Hawley ✠ West Palm Beach, Fla.; Rush Medical College, Chicago, 1937; member of the American Academy of General Practice; formerly county health officer; served during World War II; died Aug. 30, aged 42, of injuries received in an automobile accident.

Weisman, Samuel ✠ Baltimore; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1933; served during World War II; died Sept. 25, aged 42, of coronary occlusion.

White, Forrest Allen ✠ Austin, Texas; University of Texas Faculty of Medicine, Galveston, 1939; member of the American Academy of General Practice; died in Dallas Sept. 29, aged 38, of encephalomyelopathy.

White, John Huffman ✠ Chico, Calif.; University of Oregon Medical School, Portland, 1926; past president of the Butte-Glenn County Medical Society; specialist certified by the American Board of Internal Medicine; formerly fellow in medicine of the Mayo Foundation in Rochester, Minn.; served during World Wars I and II; died Oct. 22, aged 52, of carcinoma of the pancreas.

Whitney, Clarence Edward, Buckley, Wash.; University of the South Medical Department, Sewanee, Tenn., 1900; served during World War I; died Oct. 6, aged 73, of cancer.

LIEUT. JAMES E. SHROPSHIRE JR., M.C., U.S.N.R., 1925-1952

Wiercinski, Alfons Bernard, Farrell, Pa.; St. Louis University School of Medicine, 1935; physician for the Farrell public schools; affiliated with Sharon (Pa.) General Hospital; died Sept. 7, aged 46, of coronary occlusion and diabetes mellitus.

Wilkinson, Henry Brookman, Bishopville, S. C.; University of Virginia Department of Medicine, Charlottesville, 1894; served during World War I; died in Columbia (S. C.) Hospital recently, aged 80, of carcinoma of the head of the pancreas.

Woerner, Paul Carl, Bend, Ore.; St. Louis College of Physicians and Surgeons, 1918; died July 14, aged 62, of an acute heart attack.

Wright, William Henry ✠ Santa Monica, Calif.; University of Illinois College of Medicine, Chicago, 1938; fellow of the American College of Surgeons; specialist certified by the American Board of Orthopaedic Surgery; affiliated with Orthopaedic Hospital in Los Angeles; on the associate staff of Santa Monica Hospital; on the consulting staff, Culver City (Calif.) Hospital; died Oct. 1, aged 43.

Wycoff, William A. ✠ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1903; for many years on the staff of Western Pennsylvania Hospital, where he died Oct. 13, aged 78.

Young, Alexander James, Omaha; University of Nebraska College of Medicine, 1915; served on faculty of Creighton University School of Medicine and staff of Creighton Memorial-St. Joseph's Hospital; died Sept. 25, aged 61, of arteriosclerosis.

KILLED IN ACTION

Shropshire, James Edward Jr., Birmingham, Ala.; born in Lewisburg, Ala., May 16, 1925; Tulane University of Louisiana School of Medicine, New Orleans, 1949; member of Sigma Alpha Epsilon and Phi Chi Medical fraternities; commissioned a lieutenant (jg) in the medical corps of the Naval Reserve in June, 1949; served a Navy-sponsored one year rotating internship at the Jefferson-Hillman Hospital; on completion of his internship training, June 30, 1950, was ordered into active military service; on July 11, 1950, reported for his first active duty assignment at the Naval Air Station, Pensacola, Fla.; served there and at the Naval Air Station, Whiting Field, Milton, Fla., until Feb. 20, 1951, when he was ordered to the Naval School of Aviation Medicine, Naval Air Station, Pensacola, as a student under instruction; designated a Naval flight surgeon and ordered to duty with Carrier Air Group Two; promoted to rank of lieutenant, June 1, 1951; aged 27; was mortally wounded Aug. 6 aboard the USS Boxer off Korea while treating casualties at the scene of a fire on deck.

GOVERNMENT SERVICES

ARMY

Thirty-Eighth Parallel Medical Society.—The 38th Parallel Medical Society of Korea celebrated its first anniversary. In the last year the semi-monthly meetings drew physicians, dentists, nurses, and technicians from 17 nations taking part in the Korean campaign. The members have come from Turkey, Norway, India, Canada, Korea, Great Britain, Australia, Thailand, the Philippines, Greece, Belgium, the Netherlands, France, Columbia, Ethiopia, Italy, and the United States. Col. Rollin L. Bauchspies, MC, of East Mauch Chunk, Pa., new president of the society, says, "Medical personnel anywhere in Korea have a standing invitation to attend, and we've had doctors come more than 100 miles for a meeting."

The speaker at the first anniversary meeting at I Corps headquarters was 1st Lt. James F. Dickson, MC, of Milton, Mass., now chest surgeon at the 8055 Mobile Army Surgical Hospital. His paper on "Surgery of the Rheumatic Heart" was illustrated with a 35 minute color film, which was edited from several sequences taken over a period of three years at the Peter Bent Brigham Hospital, Boston. Brig. Gen. John K. Waters, I Corps chief of staff, welcomed members on behalf of Lt. Gen. Paul W. Kendall, I Corps commander.

Other new officers of the society include Capt. Lawrence E. Bach, USN, Mount Sterling, Ky., vice-president, and WOJG Ellsworth C. Pensyl, Roebling, N. J., secretary. Lt. Col. H. Haskell Zipperman, MC, Mount Holly, N. J., will continue as vice-president. The society is particularly proud of a letter from Gen. Matthew B. Ridgeway, then commander-in-chief of the Far East, who wrote: "It is encouraging to know that in the midst of stress and misery that is war, there remains unscathed the initiative, enthusiasm and desire for betterment that compels men of mutual interest to share their professional experiences with one another."

PUBLIC HEALTH SERVICE

Birmingham Cancer Survey.—A survey published by the National Cancer Institute of the Public Health Service describes the nature and extent of cancer illness in Birmingham, Ala., and Jefferson County during 1948 as compared with 1938 when a similar study was made. The National Cancer Institute was assisted in the survey by the Jefferson County Medical Society, the Jefferson County Hospital Council, and the Birmingham, Jefferson County, and state health departments. In the Birmingham area during 1948 a total of 2,641 cases of cancer were seen. The incidence (cases first diagnosed) during 1948 was 71% greater than in 1938, while the prevalence (total cases treated) was 60% greater.

These apparent increases in prevalence and incidence may have been due in part to better reporting by physicians, improvements in diagnostic and case-finding methods, and aging of the population, Dr. John R. Heller, director of the National Cancer Institute, explained. He said also, "There is evidence that cancer patients in this area are receiving better medical care than they did in 1938. Indicating improvement in diagnostic methods, there has been a marked increase in the proportion of cancer diagnoses confirmed by microscopic examination of tissues. The survey shows that more cancer patients received hospital care in 1948 than in 1938, due in part to the increase in hospital facilities in Birmingham."

In the Birmingham area during 1948, the incidence of cancer among white persons 65 years of age and older was close to 100 times the rate for white persons under 15. The incidence of cancer among nonwhite persons 65 and older was about 30 times the rate for nonwhite persons under 15. Cancer illness rates for nonwhites were considerably lower than those for whites. The difference may be due in part to the lower susceptibility of nonwhites to skin cancer. Among men the commonest sites of cancer were: the skin, 33% of all cases; the digestive system, 21%; the respiratory system, 9%; and the genital organs, 8%. Among women the commonest sites of cancer were: the genital organs, 29% of all cases; the skin, 21%; the breast, 17%; and the digestive system, 15%.

The Birmingham survey is the eighth in a new series of studies covering 10 major cities and providing current information on the nature, size, and distribution of the cancer problem in the United States. Already published are studies dealing with the Atlanta, Ga., New Orleans, San Francisco, Denver, Pittsburgh, Chicago, and Dallas, Texas, areas. Single copies of the Birmingham survey may be obtained from the National Cancer Institute, National Institutes of Health, Bethesda 14, Md.

Associate Director of Institutes of Health.—The Surgeon General of the Public Health Service has announced the appointment of Dr. C. J. Van Slyke as associate director of the National Institutes of Health. The new assignment moves Dr. Van Slyke to the central offices of the Institutes from the National Heart Institute, where he has served as director since its establishment by Congress in 1948. He will be succeeded at the Heart Institute by Dr. James Watt, who for several years has been in charge of the field laboratory of the National Microbiological Institute, located at Louisiana State University Medical School.

In his new post, Dr. Van Slyke will assist Dr. William H. Sebrell Jr., director of the National Institutes of Health. His principal responsibilities will be the coordination of the Institutes' programs of research and training grants, disease control and community services, professional training and relationships with national foundations, and health and welfare organizations. Dr. Van Slyke, a native of Minnesota, entered the Public Health Service in 1928.

Dr. Watt has been a member of the Commissioned Corps of the Public Health Service since 1938. He has spent his professional career in the conduct and administration of medical research, both in the laboratory and in the field. His principal work has been in the enteric and rickettsial diseases and in poliomyelitis. Dr. Watt is an associate professor of preventive medicine at the Louisiana State University Medical School, where Mrs. Watt, who is also a physician, is a member of the faculty of the pediatrics department.

Hospital Construction Projects.—Civilian health facility construction costing an estimated 781 million dollars was carried on during fiscal year 1952. In spite of shortages, various state agencies were able not only to maintain the rate of construction but to increase it, so that a total of 1,447 projects were undertaken in the year ending June 30, 1952. This information is revealed in the first annual report of the Division of Civilian Health Requirements of the Public Health Service, which presents, for the first time, a detailed account of the nation's health construction. The report contains a complete list of the health facility construction projects authorized during fiscal year 1952 under the controlled materials plan. Copies of the report are available from the Division of Civilian Health Requirements, Public Health Service, Washington 25, D. C.

Instruction for Nursing Aides.—The Public Health Service is developing a program of instruction for hospital nursing aides, which will be made available to hospitals throughout the United States. The project was undertaken at the request of the Health Resources Advisory Committee as a means of increasing the number of trained nonprofessional nursing personnel employed by hospitals. It is being jointly sponsored by the American Hospital Association and the National Committee for the Improvement of Nursing Service. The program calls for the preparation of a manual of procedures for use by nursing aides, a guide for instructors, and the introduction of these materials through teaching institutes in large and small communities. The Public Health Service and National Committee for the Improvement of Nursing Service will sponsor these institutes; the American Hospital Association will publish the training manual.

FOREIGN LETTERS

COLOMBIA

Course on Cardiovascular Surgery.—The Surgical Society of Bogotá celebrated its 50th anniversary on July 14, 1952. Most of the members are surgeons in the San José Hospital of Bogotá, which has accomodations for 800 surgical patients. On this occasion, the government of Colombia gave the medal of honor "Jiménez de Quesada" to Dr. José María Montoya, the only surviver of the founding members of the society. A course of lectures on cardiovascular surgery for postgraduate students was given at the faculty of medicine of the National University, July 14-19, 1952. Drs. George H. Humphreys and Ralph A. Deterling Jr. of Columbia University of New York were the lecturers. Thirty surgeons, specializing in cardiovascular surgery, took the course, which included: observation of patients with cardiovascular disease; projection of films on cardiovascular surgery; demonstration of surgical techniques in operations; and round-table discussions and lectures on basic principles of cardiovascular surgery, diagnostic methods for surgery on the vascular system, surgery on congenital heart diseases, vascular grafts, surgery on acquired heart diseases, peripheral vascular surgery, essential hypertension, portal hypertension, surgery on the venous system, and conditions required of patients on whom operations of vascular surgery are to be performed.

Colombian Congress of Pediatrics.—The Second Colombian Congress of Pediatrics, organized under the auspices of the Society of Pediatrics of Antioquia, was held in Medellin, July 7-12, 1952. Dr. Gustavo González Ochoa was the president. Delegates were present from the pediatric societies of Colombia, as well as from those of Perú, Uruguay, Argentina, Ecuador, and Venezuela. The articles read at the congress dealt with the social, educational, and popular fields of pediatrics. It was resolved that a Bolivian Pediatric Federation be established. The federation will benefit children all over the continent. The first exhibit of bibliographic notes on infantile medicine in Colombia, with more than 500 notes on infantile pathology, was shown. Special attention was given to psychiatry in children.

Congress on Radiology.—The Second Colombian Congress of Radiology, organized by the Colombian Society of Radiology, was held in Medellin, recently. The meetings were conducted in the assembly room of the faculty of medicine of Antioquia University. Scientific articles on radiological subjects were read and discussed, films were projected, and radiological material was exhibited. The congress was considered successful because of the importance of the articles read and the large number of radiologists who participated in it. The articles read before the congress will be published soon.

Personal Items.—Dr. Benjamin Castleman of the Massachusetts General Hospital visited Bogotá, on invitation from the Colombian Society of Internal Medicine. He gave a course of lectures on pathological anatomy as applied to the clinic, March 3-12, 1952. Dr. Salvatore P. Lucia, of the University of California, visited Bogotá, on invitation from this society. He gave three interesting lectures on Aug. 28-30, 1952. Dr. Hermenegildo Arruga of the Ophthalmologic Institute of Barcelona visited Bogotá, on invitation from the National University. During April, 1952, he lectured on surgical treatment of the cataract, transplantation of the cornea, and detachment of the retina. He also performed surgical demonstrations. Dr. Ignacio Chavez, director of the Instituto de Cardiología of Mexico, visited Bogotá, on invitation from the Colombian Institute of Social Security, Aug. 12-15, 1952, and gave three important lectures.

The items in these letters are contributed by regular correspondents in the various foreign countries.

LONDON

B. M. A. Has a Scientific Exhibit.—American influence, and especially the influence of the American Medical Association, made itself felt at the annual meeting of the British Medical Association, held in conjunction with the Irish Medical Association in Dublin in July. Two features, new to meetings in the British Isles though common in America, were introduced in addition to the ordinary meetings of some 16 special branches of medicine. The first of these was the institution of plenary sessions. Three plenary scientific meetings were held and were well attended. Each plenary session had one subject, which was dealt with from different angles by four or five persons, and discussions or questions followed. The subjects discussed were: "Death in Early Adult Life," "The Relief of Pain," and "Fluid Balance." The second innovation was the introduction of scientific exhibits, which have been a feature of A. M. A. meetings for some 50 years. The scientific exhibition was opened by the president, Dr. P. G. O'Farrell. He said that for many years visitors to the meetings of the A. M. A. have been impressed by the scientific exhibitions they have seen and that Dr. S. Wand (chairman of the representative body) and Mr. Lawrence Abel (a surgeon and member of the council) encouraged something similar for the British meetings. Dr. O'Farrell hoped it would become one of the chief features of future meetings. R. A. Q. O'Meara, professor of pathology at Trinity College, organized the exhibits, and Dr. M. Tierney, president of University College, placed the large hall at the disposal of the association.

At the request of the council of the British Medical Association, Mr. Abel visited the A. M. A. last year, where he received assistance, and reported to the council early this session. As a result, the Irish Medical Association decided to organize a scientific exhibition this year, and some 26 booths were provided. They included the following demonstrations: malaria, presented by the Royal Army Medical College; balance of water and salt in the body, by the National Blood Transfusion Association of Ireland; and a color film of valvulotomy, from the St. Vincent Hospital Thoracic Unit and the National Children's Hospital, Dublin. There were five separate exhibits from different departments of the Royal Cancer Hospital, London: a new water soluble contrast medium for bronchography and a new medium containing more iodine for cholecystography; the transplantation of bronchial carcinomas in mice; experimental tissue transplantation; aspects of the treatment of cancer of the breast; and isotope therapy. The Gordon Hospital for Diseases of the Rectum and Gastro-Intestinal Tract showed a demonstration of carcinoma of the large intestine, and the Irish Medical Research Council Laboratory at Trinity College, Dublin, demonstrated the chemotherapy of tuberculosis. The Lord Mayor Treloar Orthopaedic Hospital, Alton, presented an exhibit of the diagnosis and treatment of the disabilities of the hip joint. The Institute of Ophthalmology, London, showed the renal and retinal lesions of diabetic retinopathy. The Royal College of Surgeons of England showed a new nasopharyngoscope and other instruments for treating nasopharyngeal tumors. The urologic department of the Meath and St. Kevin's Hospital, Dublin, exhibited methods of estimating renal function, and the radiodiagnostic department of the Western Infirmary, Glasgow, showed roentgenograms of bone tumors. Pregnancy tests were demonstrated by the Rotunda and National Maternity hospitals of Dublin and the Bon Secours Hospital, Cork. Plastic surgery was represented by the Rooksdown House Unit of Basingstoke, and points in cerebral diagnosis by the Richmond Hospital, Dublin. A dietary exhibition was arranged by the St. Mary's College of Domestic Science, Dublin, and pediatrics was represented by details of congenital dilatation of the colon (Hirschsprung's disease) shown by the Hospital for Sick Children, Great Ormond Street, London.

Fatal Allergic Reaction to Penicillin.—W. O. Thomson in the *British Medical Journal* of July 12, 1952, describes a case of anaphylaxis due to penicillin in a man who had had many doses at monthly intervals with no ill effect. But after an intramuscular dose of 300,000 units of procaine penicillin he collapsed; he later recovered. A month later he received another dose, but this time of 300,000 units of crystalline penicillin G. (This was given to avoid the procaine element of the previous dose, which might have upset him.) He almost immediately collapsed and was dead within 15 minutes. Thomson says it is not realized often enough that serious and even fatal reactions may occur after treatment with penicillin. Penicillin is prescribed daily, often indiscriminately, to ever-increasing numbers of the populace. It is urgent, therefore, that the question of sensitivity be borne in mind before penicillin is prescribed. The increasing number of antibiotics becoming available for prescription makes the necessity for awareness of this phenomenon ever more acute. A past history of pruritus, urticaria, arthralgia, swelling of any part of the face, or rigors after an injection of penicillin should put one on guard. The delay between injection and reaction is often of some days, and the connection may be missed or misinterpreted. Previous injection of penicillin without ill effect is no assurance that sensitivity has not developed. When in doubt, intradermal tests should be carried out, patch tests to the skin being insufficient.

Hormones and Personality.—The *British Medical Journal* of July 12, 1952, comments on the work being done at St. Bartholomew's and St. Ebba's hospitals on the treatment of schizophrenic and psychopathic patients with an adrenal cortical substance: dehydroisoandrosterone. The interest of psychiatrists has been turned many times to the endocrinological aspects of personality and the influence of disturbances in endocrine balance on mental disorder. In recent work the suprarenal has come to occupy a place of importance hardly less than that earlier taken by the thyroid and pituitary. Interest is revived in the report of Broster and Allen describing the relief of paranoid psychoses accompanying virilism in female patients by the removal of an adrenal tumor. Work is now being done with corticotropin (ACTH) and cortisone in such conditions as delirium tremens and states of exhaustion. Furthermore, cortisone, when used for the treatment of rheumatism, has been found to produce euphoria and states of excitement.

In discussing this series of experiments, the journal remarks that, as might have been expected, the schizophrenic group derived less benefit than the psychopathic group. Nevertheless, a definite change in pattern of behavior was shown. The patients chosen showed a combination of physical immaturity with low or abnormal ketosteroid excretion, and they mainly showed an anergic, solitary, and apathetic clinical picture. The improvement was not conspicuous, and it resembled in degree the improvement obtained in the past when psychological treatment, or energetic work therapy, was begun with patients who had not received much attention. Cardinal and positive symptoms appear little altered; the main benefit was shown in the relief of lack of confidence and apathy, and, unless the patient was made excited and obstreperous, there was an improvement in social attitude. Further experimentation is justified, but excessive optimism would not, however, be warranted.

In the psychopathic group the results obtained are more encouraging, as they are more consistent. All these patients were boys, and the ones who responded to treatment showed a pattern of physical immaturity, even effeminacy, timidity, social inadequacy, and lack of drive. More mature persons of an aggressive rather than an inadequate type were only made worse. The effect of treatment, which was continued only over a few months, was to reduce the inadequacies that had been the grounds of selection. This clinical group is clearly a more promising one than the schizophrenic group for the prosecution of further experiments in treatment. The therapist does not, as with psychotic patients, cope with the results of morbid disintegration of the personality but only with a personality that has failed to mature and that shows certain deficiencies. These deficiencies can be explained on an endocrine basis, even if ketosteroid estimations do not prove to be especially relevant. Perhaps the most noteworthy feature in the results was the change of homosexual into heterosexual tendencies. The authors believe that administration of androsterone will probably have to be continued for a longer period than they allowed, for lasting results to be obtained.

Britain's Health.—During a half-century of brilliant progress in health, Britain's adult death rate dropped by 57%. Even more spectacular is the drop in the death rate of school children: 76% in boys and 82% in girls. Infant and maternal mortality rates are only one-fifth of what they were at the beginning of the century, and for the first time in the country's history, an infant mortality rate of under 30 per 1,000 live births was achieved. The death rate from tuberculosis (one-quarter of what it was in the respiratory forms, and one-thirteenth of the rate for 1891-1900 in the nonrespiratory kinds) reveals half a century of endeavor and achievement, but the battle is not yet over, though the outcome is certain. Even in the year 1950 there was a fall of 20% compared with 1949, when the number was the lowest then recorded in Britain. Cancer, especially that of the lung, remains the greatest problem, and so far there is little success to report as to the investigations into its causes. Tobacco has for some while been suspected, but great care must be used before one can assume that there is any close connection between increased cancer of the lung and an increased consumption of tobacco. During the 28 years from 1922 to 1950, the number of lung cancer deaths rose from 612 to 12,241. Poliomyelitis has increased, the epidemic of 1950 being responsible for 7,750 cases with 734 deaths. For every 100 patients admitted to hospital, 5 or 6 died; 9 or 10 were severely paralyzed; 17 or 18 had a degree of paralysis, which, when properly treated, would not stop them from working; and the remaining 65 or 70 would either be left with a trivial paralysis or would suffer no permanent ill effects. Two out of every three of the patients afflicted in 1950 recovered unscathed. Coronary thrombosis has also increased. The number of diphtheria deaths continues to show a steady fall. Scarlet fever and whooping cough, which caused 26,943 deaths in 1898, caused only 1,113 in 1948. Latterly there have been more notifications of these diseases but far less deaths. Among children under 15 the death rate from rheumatic fever and heart disease was the lowest ever recorded.

Food poisoning again increased. Where the source of infection was traced, nearly half the outbreaks were associated with processed, made-up, and reheated meat dishes, such as meat piés, brawn, sausages, pressed beef, reheated and cold meats, stews, gravy, and stock. It is attributed to failure to maintain an adequate standard of personal and kitchen hygiene and to faulty methods used in preparing foods for large numbers. The public can speed the progress of education by actively insisting that their food is prepared and served with due regard to cleanliness at all stages. The number of outbreaks traced to canteens was "disturbingly high," but they were reported more frequently than those originating in shops or restaurants, and there is no reason to suppose that food poisoning arose less often in restaurants than in canteens. Investigations are being carried out on synthetic cream, because nearly every outbreak of paratyphoid fever since October, 1940, when the use of natural cream was prohibited, has been traced to synthetic cream, and steps should be taken to prevent this product from serving as a convenient vehicle for enteric infection. Fifty-eight outbreaks were associated with trifles, ice cream, custard, cream buns, and the like.

Less serious is the prevalence of a mild form of dysentery; and the "universal scourge," the common cold, still defies us. The Research Unit at Salisbury continues its patient work and has made valuable observations. Over 2,000 volunteers have taken up temporary residence at the hospital since the investigation began and submitted themselves to the chance of infection with the common cold virus. Of the volunteers given potent cold producing material, half caught cold.

Electronic Sterilization.—In a statement issued by the Department of Scientific and Industrial Research, the opinion is expressed that the electronic sterilization of pharmaceutical products has definite possibilities but that much more work is required before an opinion can be expressed as to its value in food sterilization. Work on this latter problem is being carried out in this country by the food investigation organization of the department, assisted by the radiotherapeutic unit of the Medical Research

Council at Hammersmith Hospital. More information is required concerning the nature of the chemical changes that occur during the irradiation of complex foodstuffs. From the point of view of food sterilization it is also considered that, at the present stage of development, the cost of the process, particularly the initial capital cost, would be prohibitive. Neither of these limitations, however, is considered to be so great in the case of pharmaceutical products, especially antibiotics.

NORWAY

Social Medicine as a University Discipline.—When the university authorities in Oslo revised the medical curriculum shortly after World War II, this revision included the creation of a department of social medicine to which Dr. Axel Ström, formerly professor of hygiene, was appointed in July, 1951. In February, 1952, the erection of the university's Institute for Social Medicine was started. Norway is the first of the Scandinavian countries to take this step, and it is certain to lead to much pioneering in this field. Dr. Arne Marthinsen, who is Professor Ström's chief of staff, has issued a memorandum on the aims of the institute, which in the near future will be removed to and incorporated in the Rikshospital with its diverse facilities for the study of clinical medicine.

The problems to be tackled have hitherto been everyone's concern but no one's exclusive responsibility. They have been dealt with in a superficial and casual way, as isolated phenomena not receiving systematic and skilled attention. Such problems as those raised by the induction of abortion and the practice of euthanasia have hitherto been tackled in a desultory fashion. There are also problems concerning the organization of the hospital and its almoners. The training of medical students has come under study, and in the revised medical curriculum provision is made for a total of 160 hours' teaching of social medicine. The institute has also undertaken to cooperate in a nation-wide investigation of the conditions under which old persons live and the state of their health. This plan of research, the initiative for which was taken by the Norwegian National Association Against Tuberculosis, will serve to provide the basis for special measures aimed at the welfare of the older members of the community. In this, as in various other fields, the institute will count on the hearty cooperation of Medical Officers of Health and the nursing world.

Treatment of Rheumatoid Arthritis and Asthma with Quinacrine Hydrochloride.—Investigations now proceeding at the Rogaland County Hospital in Stavanger suggest that quinacrine ("mepacrine") hydrochloride has a specific effect on both rheumatoid arthritis and asthma. These investigations were in part prompted by a report by Dr. F. Page in *Lancet* in 1951, in which he gave an account of the beneficial effects following the treatment of lupus erythematodes and one case of lupus erythematosus disseminatus with this drug. Quinacrine hydrochloride was introduced in 1932 in the treatment of malaria. During World War II it was given on a large scale as a prophylactic against malaria, and it was found to provoke only slight and rare side-effects apart from yellow discoloration of the skin. At the Scandinavian Congress for Internal Medicine held in Oslo in June, 1952, an account was given by Dr. Arnfinn Engeset of the remarkable reactions of both rheumatoid arthritis and asthma to this drug.

In a preliminary communication to *Lancet* for Sept. 13, 1952, Dr. Engeset briefly summarized his and Dr. Hanssen's experiences with this drug. In a memorandum, not yet published and dated Sept. 23, 1952, Dr. Engeset reports on a patient, aged 35, who suffered from lupus erythematosus disseminatus and whose successful treatment with quinacrine hydrochloride was followed by a relapse in July, 1952, when she did not take quinacrine hydrochloride for four months and her skin was no longer yellow. After renewed treatment with quinacrine hydrochloride for two to three weeks she again felt perfectly well and could return to work. At the same time, two patients successfully treated for asthma were still free from it after seven months. While the effects of quinacrine hydrochloride on a patient with acute rheumatism have hitherto not been convincing, the responses of 11 patients with rheumatoid arthritis have been remarkable, with gradual diminution of pain and, in 5 patients, definite objective improvement observed comparatively early in the course of this treatment. Dr. Hanssen and Dr. Engeset are proceeding with these investigations and are curbing their enthusiasm by reminding themselves of the variable and apparently capricious course often taken by both rheumatoid arthritis and asthma.

Erythrocyte Sedimentation Rate.—The discovery of the erythrocyte sedimentation rate hinged on the studies of Robin Fahraeus. Another Swedish scientist, Westergren, has done much to put this test on a scientific footing, and many persons from other countries have added greatly to the literature of the subject. The latest study of it comes from the Diakonissehus Hospital in Oslo, where Dr. Knut Kirkeby and Dr. Paul Leren have undertaken a systematic review of all the patients treated in this hospital in the seven year period January, 1945, to January, 1951, who showed a sedimentation rate of 100 mm. or more per hour according to Westergren's method. Among the 9,707 patients treated in the period under review were 348 whose sedimentation rate reached this level. The chief object of this investigation was to find out to what extent a high sedimentation rate is of prognostic significance. Among the 348 patients were 82 suffering from pneumonia, which proved fatal in only 1 case. Here, then, a high sedimentation rate need not by itself indicate a bad prognosis. On the other hand, there were as many as 33 deaths among the 60 patients with chronic renal disease with a high sedimentation rate. It would therefore seem that in cases of chronic disease of the kidneys a high sedimentation rate may be taken to indicate advanced renal failure. In all the 49 patients with cancer who had a high sedimentation rate, the disease was inoperable on account of metastases, and there were as many as 45 deaths among these patients in hospital or soon after discharge. Experiences with the 26 patients with polyarthritis suggested that this test is one of the best means for checking on the effects of any given treatment. In another series of 14 patients no definite diagnosis could be given to explain the high sedimentation rate. The main conclusion to be drawn from this study is that a high sedimentation rate is of great prognostic significance in some, but not all, diseases.

PARIS

Centenary of Birth of Pierre Marie.—An official meeting was held in the great lecture hall of the Faculty of Medicine on July 9, under the presidency of Prof. Léon Binet, dean of the Paris Faculty of Medicine. It was attended by a large number of French and foreign neurologists. On the same day, a scientific meeting was also held at the Salpétrière Hospital. In turn, Professors G. Guillain, Alajouanine, Jeán Lermite, and Guy Laroche recalled the life and the works of Pierre Marie concerning aphasia and acromegaly (described by the author in 1886); Charcot-Marie's amyotrophy (1886); cerebellar heredo-ataxia (1893); and Pierre Marie's rhizomelic spondylosis (1886). On July 17, 1952, at the Bicètre Asylum, a commemorative tablet was unveiled recalling the works accomplished by Pierre Marie in this institution.

Death of Prof. A. Lesage.—Prof. A. Lesage, French pediatrician, died at nearly 90 years of age. A hospital physician in 1896, he was in charge of the Herold Hospital till he reached 65. He was general secretary to the Superior Council for the Protection of Infancy and then director of the infancy committee. He was appointed a member of the National Academy of Medicine in 1927. In 1933, he was the promoter of an International Congress for the Protection of Infancy. An associate of the Pasteur Institute, he devoted himself to the study of the intestinal flora of the nursling and the child. His many scientific works include: "Treatise of the Diseases of Nurslings," translated in Germany and Russia in 1910; "Arthritic Debility in Infants," in 1925; and "Infancy and Heredity," in 1933. He is the author of an extensive historical study of the evolution of puericulture, and, together with J. Huber, he wrote a historical work on "The Child Through the Ages and Art." He was one of the founders of a school of puericulture in 1927.

CORRESPONDENCE

HEALTH INSURANCE PLAN OF GREATER NEW YORK

To the Editor:—The Oct. 25 issue of THE JOURNAL published a critical article by Dr. Arthur M. Master on the Health Insurance Plan of Greater New York that contains many errors. As THE JOURNAL is the only forum through which correction may reach the medical profession, I respectfully ask that the following facts be published in justice to hundreds of physicians participating in the plan:

1. It has been the history of group practice that its establishment in a community arouses antipathy among local physicians who prefer individual practice. The epithet "sweatshop medical personnel" or its equivalent has been used before to injure the professional reputation of such groups. Dr. Master's use of this epithet in regard to the 30 medical groups engaged in prepaid group practice in New York represents an unwarranted reflection on the professional skill and integrity of 950 of his colleagues in this city, 46% of whom have been qualified by the American Specialty Boards.

A Medical Control Board of 15 physicians determines the professional standards and minimal physical facilities required for group practice under the plan. The quality of medical care is under constant supervision by the medical department of HIP and by full-time Associate Medical Directors for each borough of the city. Good medical care is also assured by the fact that the 30 medical groups in the city are autonomous and competitive on the basis of quality of service and subscriber satisfaction.

To our knowledge, Dr. Master has never visited the medical groups. Undoubtedly some complaints have come to his attention, similar to those that arise constantly in ordinary private practice. But general subscriber satisfaction is indicated by the fact that the termination rate last year for all causes (loss or change of employment, removal from the city, failure to convert from a family to an individual contract on reaching 18 years of age, and dissatisfaction) was only 7.8%. It has averaged 8% a year for the five years of HIP's existence. I doubt whether any medical insurance plan has a better record. Subscriber satisfaction is also evidenced by thousands of letters of appreciation.

2. HIP is exclusively a service plan in which comprehensive medical care is provided by balanced teams of physicians and qualified specialists who as medical groups agree to give all the required services. Any objection to such a "restrictive panel of physicians" applies to all service plans, such as Blue Shield, in which subscribers who expect medical care without extra charge are also restricted to those panel physicians who have agreed to accept the scheduled remuneration. HIP is not a closed service panel, for it welcomes additional medical groups that meet the required professional standards and staff organization for comprehensive service.

3. Without any personal experience, Dr. Master assumes that "the intimate doctor-patient relationship is lost," whereas the opposite is true. One of the largest family welfare agencies and a medical school are jointly sponsoring a family health maintenance project at one of the HIP groups because it has a most intimate and continuing doctor-patient relationship. Ninety per cent of HIP's low-income families have chosen a family physician of record, who is responsible for their continuing medical care. Through him they obtain all the required specialist consultations as well as laboratory and x-ray examinations and visiting nurse services. Unrivaled opportunities for good medical practice are therefore available to him, for there are no financial barriers to his use of these facilities and services in the interest of his patients. That his work may be unhurried, his panel of families is limited by the Medical Control Board and by his group director. He is relieved of all obstetric work and also of the routine care of children up to school age. As he receives a salary from his group, he does not have a fee-for-service incentive for "mass production to increase his income."

As HIP subscribers may readily change their family physician to another within the group of their selection or transfer to another group if dissatisfied, there is every incentive for family physicians to provide prompt and unhurried medical attention to the families under their care. Exceptions occur, but they are not more numerous than in other forms of practice. Actually, the opportunities of a continuing doctor-patient relationship are especially good among the lower income families, who constitute 93% of the enrollment.

4. The statement that HIP physicians are underpaid is made without knowledge of the facts. I have also heard the reverse rumor that they are overpaid, which is equally untrue. Groups whose enrollment has failed to grow have a proportionately small income to distribute to their member physicians, for there is no subsidy. On reaching the present average enrollment size (14,000), a group's income is fully adequate. The remuneration of the participating physicians from HIP is then at least equal to the recently reported average incomes of non-HIP physicians in this city. Most HIP physicians are partners, and, in addition to their salaries, they share in the total income of the group and own a share of its assets.

5. Dr. Master miscalls prepaid group practice "socialized medicine," to which it bears no resemblance. HIP, like Blue Cross and Blue Shield, is a voluntary insurance plan duly incorporated under state law. It is therefore obliged to meet its obligations entirely out of earned premiums like any other insurance company. By no stretch of the imagination can this be termed socialistic. He is also in error in stating that HIP is subsidized by employers, labor unions, and the city. All employers or labor unions who contract with HIP pay their respective share of the required premiums, exactly as others do who contract with Blue Cross, Blue Shield, or commercial insurance carriers. This is not a subsidy to the company.

The attitude of HIP toward national compulsory medical insurance is revealed by the fact that 19 of the 24 members of the board of directors are opponents of any governmental intervention in medicine. My own activities in opposing national compulsory medical insurance are on record in the proceedings of public hearings before the Senate Committee on Education and Labor in 1946, 1947, and 1949. The success of voluntary insurance such as HIP in providing comprehensive coverage eliminates the last remaining argument for compulsory medical insurance.

6. Dr. Master remarks that advertising by an insurance plan like HIP "may be legal but it also may be unethical." The two other nonprofit medical insurance plans in New York City advertise. In part for the guidance of HIP in this matter, the Medical Society of the County of New York on March 22, 1948, adopted an interpretation of the principles of Professional Conduct on the recommendation of its Board of Censors, which stated specifically that advertising by such nonprofit plans "is not of itself improper or unethical." Four years later, on April 14, 1952, the society adopted a new version that omitted this paragraph, but the members were warned at the same time that no inference or conclusion was to be drawn by them from this omission. In 1949 the House of Delegates of the American Medical Association recognized officially that all legally authorized nonprofit plans required a means for bringing their existence, rates, and benefits to public attention (Principles 5, 8, and 10 of the Twenty Principles for Lay-Sponsored Voluntary Health Plans transmitted to state and local medical societies).

The criticism of prepaid group practice that its subscribers are denied "free choice" of any licensed physician in the state is not valid. The subscribers exercise free choice when they elect to join. Should they change their minds subsequently, they are at liberty at any time to discontinue their monthly subscription, which under HIP is like term insurance, and choose any physician outside the plan whom they prefer and can afford to pay. In my opinion, the members of our profession who would eliminate prepaid group practice and make this form of voluntary insurance unobtainable by the public are themselves the real opponents of "free choice."

Prepaid group practice has a right to exist without constant harassment. An excellent editorial in THE JOURNAL of July 16,

1949, took members of the profession to task who employ such methods to enforce the status quo on their medical colleagues and the public generally, stating: "Instances have occurred in which physicians, for political, commercial or emotional reasons, have endeavored to utilize the Principles of Medical Ethics as a means of producing embarrassment, distress or loss of reputation of other physicians whom they envy or whose open competition they fear. The Principles of Medical Ethics were not designed for any such purpose, and the attempt to utilize the Principles of Ethics for such purposes may well be in itself unethical."

I take this occasion to quote the editorial, for it had a significant influence for a time in restraining those who were endeavoring to retard the evolutionary changes in medical practice that are the result of the times in which we live.

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THE GENERAL PRACTITIONER

To the Editor:—I have been reading the monthly message on the President's Page with a great deal of interest. May I say first that my opinion is impersonal, because, as a general practitioner in a small community, I have access to a hospital and the privileges therein. But I have a friend who practices in a large city, and he sent a patient to a hospital at which he (let us call him Dr. B.) had no privileges. His reason for doing so was that the medical facilities were better than at the hospital at which Dr. B. had privileges. His patient therefore was turned over to another physician. The patient was struck, momentarily, by the possibility that Dr. B. was incompetent and so could not practice on the staff of the better hospital. Later, the patient saw that many other capable general practitioners were also denied privileges and that there was not a general practitioner on the hospital staff. Dr. B. is a skilled physician who several years ago was asked by a local hospital to limit his activities to one specialty. Dr. B. felt that, in justice to his patients, he could not thus limit his practice. He refused to do so and, in two weeks, was dropped from the staff along with 200 other general practitioners. My friend Dr. B. now has privileges at a small private hospital at a traveling distance of one hour and 15 minutes from his office. It is not so completely staffed as the larger, recognized hospitals, and the smaller pay acts as a deterrent to interns, residents, and nurses; therefore, when Dr. B. has a patient in labor, it may necessitate leaving his practice completely for from three to five hours, depending on how much confidence he has in the nurses and interns at his hospital.

It is now the recognized procedure, in the large city in which Dr. B. practices, for staff appointments to be offered only to men who have board ratings, who are specialists in name, whether they carry this out in practice or not. Therefore, cliques spring up in which a patient is shunted from one specialist to another. I have often wondered how such a situation could arise. Those medical men who have reached the pinnacle of their profession no longer consider the men below them. They lack the gratitude that has enabled them to reach the peak, as manifested by the referrals and the accolades of the men who studied under them, and they lack the humility that should make them appreciate the struggles of those less fortunate.

The A. M. A. and the medical schools are applauding the general practitioner, but none of the large city hospitals have made an effort to open their staffs to the general practitioner. Had the specialists endeavored to fight for the general practitioner, he might have had a better break. And so, in a large city 30 miles from where I practice, there are 20 recognized general practitioners and over 100 specialists, because the hospitals require restriction on practice to one specialty. Naturally, the general practitioner is disgruntled. He objects to being called out at night when the specialist refuses to answer his telephone. The patient is not slow in sensing this disharmony in the profession. Therefore, before there is talk about the vast amount of work done by the Association in education, let us ask what steps have been taken to give the general practitioner a break in these cities that require specialization as one qualification for staff privileges.

This has not affected me as yet, but I become heartsick when I see my classmates denied the privileges of medical practice, theoretically in the interest of furthering medical standards, while they are being applauded as the foundation of the medical profession.

EDWIN MATLIN, M.D.
Mt. Holly Springs, Pa.

NOTE:—*The American Medical Association has long advocated that the general practitioner as well as the specialist should be able to use the modern hospital as far as his training and experience warrant. This basic principle is also observed in the standards of the Council on Medical Education and Hospitals, which specify that the medical staff should be composed of graduates in medicine who are properly qualified by training, licensure, and ethical standing and are proficient in the fields of practice to which they devote themselves. To further clarify the Association's position with respect to hospital privileges, the House of Delegates adopted in 1946 a resolution stating that appointments to general practice sections should be made by the hospital authorities on the merits and training of individual physicians and that the creation of such sections would not prevent hospitals from being approved for interns or resident physicians. In the following year the standards governing the registration of hospitals were modified in such a manner as to encourage the establishment of general practice sections and the House of Delegates also adopted a special report of the Council on Medical Education and Hospitals stating that " . . . it was never intended that staff appointments in hospitals generally, or even in hospitals approved for residencies, should be limited to board certified physicians, as is now the policy in some hospitals. Such policies, if practiced extensively, are detrimental to the health of the people and, therefore, to American medicine. Hospital staff appointments should depend on the qualifications of physicians to render proper care to hospitalized patients, as judged by the professional staff of the hospital, and not on certification or special society memberships." This action of the House endorsing the Council's report should indicate clearly to the boards of trustees and directors of hospitals that any rule barring a physician from staff privileges because he does not hold board certification or membership in a special society is not in accord with the expressed policy of the American Medical Association. Studies made by the Council on Medical Education and Hospitals in cooperation with the American Academy of General Practice show that an increasing number of hospitals are participating in the development of general practice sections. Thus it is encouraging to note that 1,660 general hospitals are now maintaining services for general practitioners, 1,202 have organized their general practice sections in accordance with the Academy's Manual on General Practice Departments in Hospitals, and 1,358 have granted qualified general practitioners additional staff privileges in specialty divisions. In this connection, it should be emphasized that every effort is being made to extend still further the opportunities for hospital service so that the general practitioner may utilize his full knowledge and skill in the care of individual patients.*—ED.

REHABILITATION OF PATIENTS WITH CEREBROVASCULAR ACCIDENTS

To the Editor:—I am misquoted in the advertisement "Spectrum," which appears on advertising page 44 of the Sept. 13, 1952, issue of THE JOURNAL.

The correct remarks should be: "Rehabilitation has been achieved in ninety-five per cent of the patients with cerebrovascular accidents accepted at The Bellevue Hospital Physical Medicine and Rehabilitation Service. Of these, approximately thirty per cent were able to be placed in productive work.

"Patients with congestive heart failure can be rehabilitated as well as those with angina of coronary disease, provided the capacity of the patient is matched by the physical demands of selected jobs."

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BUREAU OF LEGAL MEDICINE AND LEGISLATION

MEDICOLEGAL ABSTRACTS

Admissibility in Evidence of Chemical Tests for Intoxication.—The defendant was charged with the offense of driving his automobile while drunk and was found guilty by a jury in the trial court. Accordingly, he appealed to the criminal court of appeals of Oklahoma.

The defendant, while driving his two door, 1949 Ford automobile north on Lewis Street at about 3:35 p. m., collided with a Nash automobile being driven in an eastwardly direction, which ran through a stop line at the west intersection of Lewis and 31st streets in Tulsa, Okla. Mr. Van Horn, police officer Murray Smith, and police officer Ed Erwin, all of whom investigated the collision immediately thereafter, testified that the defendant had been drinking. These officers testified that the defendant's speech was thick and that he wobbled or staggered.

Mr. Hill, traffic officer of the Tulsa Police Department, testified, over objection, that he had made a breathometer test of the defendant's breath. The record shows that the test was made voluntarily and with the defendant's consent. He testified in relation to the Harger breathometer or drunkometer, which he demonstrated, that he had studied the use of this instrument at Northwestern University 28 hours and had had 150 to 200 hours' subsequent experience in testing the instrument. He explained that the defendant breathes into a balloon, inflating it, and that the air then passes from the balloon into a solution of permanganate of potash and into a vial, "where it mixes with a solution and changes color from purple to this color," which "shows the percentage of alcohol in a man's body." Thereafter the air passes into another vial where it is sealed and later delivered to Dr. Beddo, who makes a chemical analysis thereof to determine the actual alcoholic blood content of the subject of the test. In this instance, the test showed the breath of the defendant to contain .16% alcohol. Moreover, the witness testified the defendant voluntarily gave a specimen of his urine, which, likewise, was delivered to Dr. Beddo for chemical analysis. On cross examination, Mr. Hill said that, according to charts prepared by Dr. Beddo, when one whose breath measures as much as .15% alcohol he is under the influence of alcohol and therefore an unsafe driver.

Dr. Beddo, who was qualified as a physician and as able to make chemical analyses, testified that the breathometer and urine tests would show the alcoholic content, if any, of a person's blood. He further stated that these tests, such as the R. N. Harger drunkometer, had been approved by the American Medical Association, the Commissioner of National Safety, the Federal Bureau of Investigation, by many courts, and 12 of the states by statute. He explained the charts used in connection with such tests and stated that in his opinion they were accurate. The tests and charts, as approved by the American Medical Association and other agencies, established the fact that a person with .15% by weight of alcoholic blood content would be an unsafe driver. But Dr. Beddo stated some authorities place the degree of alcoholic blood content for unsafe driving at less than .15%. He testified that the defendant's tests, both as to his breath and urine, showed .16% alcohol blood content and that when a person reaches the .15% level, both as to his breath or his urine, he is unable to control his reactions and is an unsafe driver, notwithstanding he may be able to perform all the physical tests such as walking a straight line and picking up coins.

The defendant's first argument was that expert opinions on the ultimate fact in issue are inadmissible as invading the province of the jury where the jury is equally qualified as the expert to draw conclusions. He urged in support of this argument that the state predicated its case almost entirely on the credence of the conclusions and opinions of police officer M. T. Hill and Dr. Beddo, which, he contended, constituted an invasion of the province of the jury. The defendant, said the court, overlooks the proposition that the evidence of officer Hill and Dr. Beddo was offered as the testimony of experts. Both officer Hill and Dr. Beddo were qualified as experts. The record does not disclose any attack on their qualifications. Their conclusions, based on the drunkometer and urine tests, was that the defendant's blood contained .16% alcohol by weight and that a person with that amount of alcohol in his blood would be in a state of intoxication. Therefore, the defendant's contention that the conclusions of such experts as officer Hill and Dr. Beddo invades the province of the jury is untenable. Inasmuch as there are some facts and principles that may be raised as indisputable in all subjects, the law permits persons who are expert in their several callings to express their opinion on subjects with which their studies and occupations have made them familiar. In the case at bar, the alcoholic content of both the defendant's breath and his urine was a matter not within the ordinary training or intelligence of the average juror; hence not only the facts but the conclusions in relation thereto were matters of professional or scientific knowledge or skill, concerning which qualified experts are permitted to give testimony.

The defendant next contended that the urine and breath tests taken at 5:00 p. m. following the collision at 3:30 p. m. were too remote in point of time to be admissible in evidence to show alcoholic blood content at the time of the collision. This contention, said the court, appears to us to be without merit on its face, particularly in view of the evidence that the defendant offered no proof in support of the contention and further in view of the fact that Dr. Beddo testified a human body will burn about "⅓ of an ounce of alcohol an hour, or about .015% of blood alcohol per hour." Dr. Beddo concluded that, the test being made at 5:00 p. m. and the defendant not having taken any alcohol from the time of the collision at 3:30 p. m. to the time the tests were made, the defendant would be more drunk at 3:30 p. m. than he was at 5:00 p. m. This seems sound to us, said the court. Such being true, the longer the test was delayed the more favorable the situation would become for the subject. We believe this conclusion would be obvious.

Finally the defendant contended that the drunkometer and urine analysis tests for determining whether the defendant is under the influence of intoxicating liquor have not gained such scientific standing for infallibility as to justify admission of expert testimony concerning them. This contention is without support in the record, said the court. Dr. Beddo testified that the Harger breathometer is recognized as a proper test by different medical schools and colleges, the American Medical Association, the Commissioner of National Safety, and the Federal Bureau of Investigation. Moreover, he testified that the medical profession recognizes urine, blood, and saliva tests also as being accurate methods of determining the alcoholic blood content of a subject suspected of being intoxicated. We believe, continued the court, that such evidence should be accorded such weight as the jury sees fit to give it. We think an accused should not be permitted to consent to a drunkometer and urine test without being subject to its detriment as well as its benefits. We hold that, under the circumstances of this case, the drunkometer evidence was admissible. This court is of the opinion that we should favor the adoption of scientific methods for crime detection, where the demonstrated accuracy and reliability has become established and recognized. Justice is truth in action, and any instrumentality that aids justice in the ascertainment of truth should be embraced without delay. We believe that chemical tests of such body fluids as blood, urine, breath, spinal fluid, and saliva performed by experts, have been approved as having gained that scientific recognition for infallibility as to be admissible in evidence.

Accordingly, the judgment finding the defendant guilty of operating a motor vehicle while under the influence of intoxication was affirmed. *Toms v. State, 239 P. (2d) 812 (Oklahoma, 1952).*

MEDICAL LITERATURE ABSTRACTS

UNITED STATES

A.M.A. Arch. Dermat. and Syphilol., Chicago

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Recent Developments in Physiology of Sweat Apparatus. W. C. Lobitz Jr.—p. 152.
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Alopecia Areata: Prevalence in Japanese and Prognosis After Reassurance. H. L. Arnold Jr.—p. 191.
*Hypothyroidism, Liver Damage, and Vitamin A Deficiency as Factors in Hyperkeratosis. W. M. Shaw, E. H. Mason and F. G. Kalz.—p. 197.
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Sternal Marrow Findings in Various Dermatoses. F. Pascher, M. N. Richter, H. Bellach and F. Simm.—p. 251.
Gnathostomiasis in Japan. K. Kitambura.——p. 276.
Zirconium Salts in Prevention and Treatment of Rhus Toxicodendron Dermatitis. G. A. Cronk.—p. 282.

Hypothyroidism, Liver Damage, and Vitamin A Deficiency in Hyperkeratosis.—The absorption of carotene and its biologically active form, vitamin A, from the small intestine is linked with the absorption of lipids, is enhanced by the presence of lecithin, and, in the case of carotene, is dependent on the presence of bile salts. About 30 to 50% of the ingested carotene is converted to vitamin A, and in man both conversion and storage take place in the liver. Because carotenemia usually occurs in association with diseases of the liver and thyroid gland, it has been suggested that the metabolism of carotene depends on the integrity of these organs. High plasma carotene levels and low plasma vitamin A levels are observed in most cases of hypothyroidism. The authors describe a 61-year-old woman who complained of fatigue, dyspnea, intolerance to cold, and stiffness of the hands and feet. The skin had a faint yellowish tinge and was dry throughout; on the back and on the extensor surfaces of the upper arms and thighs, a fine, branny desquamation was noticeable. The inner and the posterolateral aspects of the thighs showed numerous follicular keratotic lesions. Some of these follicular cones showed thin, horny spines. Palms and soles showed keratosis. On the ankles and on the lower legs were numerous flat, papular, and patchy keratotic lesions. On the basis of the patient's clinical condition, low basal metabolic rate, electrocardiographic findings, blood cholesterol level, and anemia a diagnosis of hypothyroidism was made. Liver dysfunction was indicated by the slightly elevated bilirubin level, impaired hippuric acid synthesis, and sulfobromophthalein sodium retention. The lichen spinulosus on the thighs may be considered a lesion typical of vitamin A deficiency. The flat papular and patchy keratosis on and about the ankles has been described as occurring in such cases. As a result of therapy with vitamin A and thyroid extract liver function improved, the blood carotene level decreased, and the keratoses disappeared. Because the vitamin A content of the pretherapy diet had been more than adequate, it was thought that the main therapeutic effect was due to thyroid extract. It is suggested that the vitamin A deficiency was due both to decreased intestinal absorption and to decreased synthesis of vitamin A from carotene in the liver. The author mentions another case in which hypothyroidism and vitamin A deficiency concurred and suggests that such cases may be more frequent than is recognized.

A.M.A. Arch. Neurology and Psychiatry, Chicago

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Primary Malignant Melanoma of Spinal Cord. A. B. King, J. W. Chambers and J. Garey.—p. 266.

A.M.A. Arch. Otolaryngology, Chicago

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Physiology of Hearing: What Have We Learned About It Following Fenestration Surgery? J. Lempert.—p. 101.
Brain Abscess—Otogenic and Rhinogenic. B. H. Shuster.—p. 114.
*Intraepithelial Carcinoma (Cancer in Situ) of Larynx. F. Altmann, I. Ginsberg and A. P. Stout.—p. 121.
Jugular Foramen Syndrome: Evidence That Transient Cases May Be of Viral Origin. J. H. Font.—p. 134.
Cancers of Head and Neck. D. S. Cunning and F. M. Turnbull Jr.—p. 142.
Mental Factors in Relation to Reconstructive Surgery of Nose and Ears. A. Palmer and S. Blanton.—p. 148.
Surgery and Neurology of Ménière's Disease: I. Role of Chorda Tympani Nerve in Tinnitus, Vertigo, and Deafness. S. Rosen.—p. 152.
Primary Skin Grafting of Radical Mastoidectomy Cavities with the Brown Electrodermatome. M. H. Zwerling.—p. 161.
Intranasal Cortisone: Preliminary Study. J. W. Wall and N. Shure.—p. 172.
Surgical Treatment of Benign Nasopharyngeal Disease in the Adult. R. H. Riggs.—p. 177.
Audiometric Studies Following Mesencephalotomy and Thalamotomy. M. Saltzman.—p. 194.

Intraepithelial Carcinoma of Larynx.—Laryngeal intraepithelial carcinomas, which are comparable to those found in many other mucous membranes and in the skin, have been largely disregarded. They show essentially the same cellular characteristics as ordinary squamous cell epithelioma but are distinguished by their peculiar spread within the epithelium instead of infiltrating growth into the underlying stroma. In 312 consecutive patients with laryngeal cancer there were 29 purely intraepithelial cancers and 19 combined intraepithelial and infiltrating growths. The intraepithelial tumors originated from stratified squamous epithelium, most frequently on the anterior third of the vocal cord, and spread into adjacent areas, sometimes even across the anterior commissure into the other cord. The noninvasive tumors are, as a rule, smaller than the invasive growths. Since

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Titles marked with an asterisk (*) are abstracted.

the duration of the clinical symptoms was about the same in all the groups, the size of the lesions and the onset of infiltration depend not so much on the duration of the disease as on the rate of growth of the tumor tissue. This would explain why the average age of the patients with intraepithelial cancers of the larynx was not significantly lower than that of those with invasive cancers. In view of the lesser degree of malignancy of cancer in situ, the treatment can be more conservative than in infiltrating cancers. Radiotherapy has evidently a better chance for success than in extensively infiltrating cancer, and should be considered, particularly in cases in which laryngectomy is the only alternative.

American J. Digestive Diseases, Fort Wayne, Ind.

19:241-272 (Aug.) 1952

Hepatic Tests in Preterminal Hepatic Insufficiency. J. L. Switzer, F. Steigmann, J. de la Huerga and F. Schaffner.—p. 241.
Differential Diagnosis of Hepatitis and Liver Cirrhosis by Means of Cholecystography. K. A. J. Järvinen and V. E. Paltia.—p. 244.
Effect of Sodium Carboxymethylcellulose on Blood Cells. I. B. Brick. —p. 248.
Surgical Treatment of Portal Hypertension. R. A. Nabatoff.——p. 251.
In Situ Hydrogen Measurements of Mouth, Esophagus and Stomach in Newborn Infants. J. E. Bradley and M. Tilghman.—p. 255.
Bentyl Hydrochloride: Successful Administration of Parasympatholytic Antispasmodic in Glaucoma Patients. A. R. Hufford.—p. 257.
Pre- and Post-Surgical Use of Intravenous Glucose Infusion with Aqueous Multi-Vitamin Complement: Report of 137 Cases. C. A. Zoll, R. Shirley and S. Villani.—p. 259.

American Journal of Medical Sciences, Philadelphia

224:121-246 (Aug.) 1952

*Bone Marrow and Carcinoma of Prostate. J. A. Clifton, R. J. Philipp, E. Ludovic and W. M. Fowler.—p. 121.
Determination of Statistically Minimum Number of Cases. R. H. Peckham.—p. 131.
Plasma Sodium and Potassium Concentrations in Congestive Heart Failure: Relationship to Pathogenesis of Failure. L. T. Iseri, R. S. McCaughey, L. Alexander and others.—p. 135.
Cardiorespiratory Responses and Electrocardiographic Changes During Exercise Before and After Intravenous Digoxin in Normal Subjects. P. N. G. Yu, F. W. Lovejoy Jr., B. Hulfish and others.—p. 146.
*Leukemia and Other Malignancies in Physicians. S. Peller and P. Pick. —p. 154.
Dermatomyositis and Malignant Neoplasm. C. E. Cottel.—p. 160.
Effects of Pressure Breathing on Venous Pressure; Comparative Study of Positive Pressure Applied to Upper Respiratory Passageway and Negative Pressure to Body of Normal Individuals. G. J. Beck, H. E. Seanor, A. L. Barach and D. Gates.—p. 169.
Cardiovascular and Metabolic Effects of Cortisone, Hydrocortisone and Other Steroids in Rat. G. M. C. Masson, A. C. Corcoran, H. Dustan and I. H. Page.—p. 175.
Khellin Therapy in Angina Pectoris. J. E. Strang and J. B. Vander Veer.—p. 186.
Glucose Absorption from Duodenum in Patients with Steatorrhea. R. M. Taylor and K. J. R. Wightman.—p. 190.
Antistreptolysin O and Antihyaluronidase Titers in Health and in Various Diseases. L. A. Rantz, J. M. Di Caprio and E. Randall.—p. 194.
Effect of L-Cysteine on Nitrogen Mustard Therapy. A. S. Weisberger, R. W. Heinle and B. Levine.—p. 201.
Dietary Cholesterol and Atherosclerosis. C. Moses.—p. 212.
Massive Bleeding from Upper Gastrointestinal Tract. L. F. Jacobson and C. G. Johnston.—p. 219.
Amaurosis Fugax. H. P. Wagener.—p. 229.

Bone Marrow and Carcinoma of the Prostate.—To determine the value and practicality of bone marrow aspirations in the diagnosis of early metastasis from carcinoma of the prostate, the authors aspirated marrow from the manubrium of the sternum and the right iliac crest in 57 patients with this disease. Carcinoma cells were demonstrated in the marrow smears of 19 patients, in 5 of whom there was no roentgenographic evidence of bone involvement. Thus by use of routine bone marrow puncture, 8.7% of the patients in the authors' series were found to have metastatic carcinoma that otherwise would not have been detected at the time of examination. In the 19 cases in which the bone marrow contained carcinoma cells, the sternum contained carcinoma cells in 16 cases and the ilium in 13; the almost equal frequency with which carcinoma cells were observed in the marrow from the sternum and the ilium lends support to the theory of vascular dissemination of carcinoma of the prostate. Adjunctive laboratory studies were done, including peripheral blood smears and determination of phosphatase levels; these were helpful but not diagnostic, the alkaline phosphatase level being the most useful. No correlation was found between the presence of metastases and the Broder's grade of malignancy of the primary carcinoma. Since an adequate bone marrow examination can be performed in one hour or less, the authors recommend it be done in patients with carcinoma of the prostate being considered for radical surgery.

Leukemia and Other Malignant Disease in Physicians.—By comparing the causes of deaths in 11,481 physicians who died between January, 1947, and December, 1951, with the vital statistics issued by the federal government, the authors showed that physicians have an increasing risk of having leukemia. This risk is not limited to radiologists and dermatologists, but is shared by the many physicians who routinely use fluoroscopy. The increased mortality from leukemia is already apparent in the age group between 25 and 29 years and is about three times normal in all age groups. In physicians almost 9% of all malignant disease appears as leukemia. In the age group between 25 and 34 years, physicians also have an increased mortality from nonleukemic cancers, whereas the risk of dying from malignant lesions other than leukemia in the age groups between 40 and 74 years is diminished. The minimum latent period of leukemia or other cancer due to exposure to roentgen rays and radium is less than five years; when radium or radon enters the body by inhalation, the minimum latent period is four to five times as long, but the excess incidence of cancer in the organ of main deposition, the lung, is nevertheless tremendous. The duration of the latent period depends on the intensity of exposure, on the route taken by the rays or the radioactive substance, the speed with which the latter are eliminated, the degree of the person's predisposition to cancer, and the ability of the respective tissue to grow and multiply. The protection afforded by the common use of apron and gloves and even by the newly designed lead glass fabric gown is not satisfactory. The neck and head, which in the authors' opinion are in the first line of attack, require an additional protective hood.

American Surgeon, Atlanta, Ga.

18:739-854 (Aug.) 1952

Extraskeletal Osteochondrosarcoma: Review of Literature and Report of Case. L. W. Shaffer Jr.—p. 739.
Megacolon—Frozen Section Control of Surgical Treatment. O. T. Kirksey Jr. and J. H. Childers.—p. 748.
Primary Hyperparathyroidism with Three Case Reports. M. N. Davis. —p. 751.
*Porphyria and Its Simulation of Surgical Conditions. E. H. Rentschler. —p. 758.
Obturator Hernia. E. B. Rowe and G. A. Bynum.—p. 770.
Importance of Specific Antibiotic Therapy in Surgical Infections. C. D. Dukes.—p. 778.
Management of Urinary Bladder in the Paraplegic. O. H. Graves.—p. 784.
Failure of Reperitonealization to Prevent Abdominal Adhesions in Dog. A. O. Singleton Jr., E. B. Rowe and R. M. Moore.—p. 789.
Eosinophilic Granuloma of Skull: Report of Six Cases. G. A. Bynum. —p. 793.
Restoration of Skin of Male External Genitalia Following Trauma. C. C. Snyder.—p. 806.
*Development of Sarcoma in Bone Subjected to Irradiation: Case Report. R. De Young.—p. 816.
Intestinal Antisepsis. F. J. Wolma Jr.—p. 820.
Meckel's Diverticulum: Case Report of Patent Omphalomesenteric Duct. J. M. Thiel.—p. 826.
Plasma Cell Mastitis. G. A. Bynum and E. B. Rowe.—p. 836.
Management of Radiation Injuries. S. R. Lewis.—p. 842.

Porphyria Simulating Surgical Conditions.—Three types of porphyria have been distinguished: congenital, acute, and chronic. The congenital type occurs most frequently in boys and becomes manifest in infancy or early childhood. The principal features are red urine, pink discoloration of the teeth that later changes to reddish-brown, and photosensitivity of the skin, with epidermolysis bullosa or hydroa vacciniforme resulting in scarring, hirsutism, hypertrichosis, enlargement of the liver and spleen, and anemia. Patients with this form rarely come to the attention of surgeons and usually die of intercurrent diseases. The acute type of porphyria is either idiopathic or toxic, the latter usually being due to some drug. The acute type occurs chiefly in females and between the third and fifth decades of life. A familial tendency has been noted in the idiopathic form. Abdominal pain usually brings the patient to the physician. On examination of the abdomen, muscle spasm, tenderness on palpation, and rebound tenderness are usually absent. This is an important differential point. It is important to ask about the color

of the urine. The port wine or Burgundy wine color of the urine is due chiefly to type 3 porphyrins, although those of type 1 may also be present. Many patients also excrete the colorless chromogen-porphobilinogen, which turns pink, red, or red-purple on exposure to light. The presence of this substance can be determined also by the Watson-Schwartz test, which is briefly described. Since the porphyrin compounds exhibit characteristic absorption spectrums in acid solution, spectroscopy is likewise helpful in the diagnosis. In the differential diagnosis other conditions likely to cause the excretion of red urine must be considered, as well as acute abdominal conditions such as appendicitis, peritonitis, pancreatitis, perforated peptic ulcer, cholecystitis, biliary colic, bowel obstruction, renal colic, pelvic disease, and pheochromocytoma. Many of these patients have previously undergone abdominal exploration that disclosed no abnormality other than spasm of the bowel musculature. Since the central nervous system may become involved, many neurological symptoms may be present, including delirium, depression, mania and hallucination, ocular and facial palsies, amaurosis, seizures, stupor, and coma. The over-all survival rate of an attack of porphyria is about 50%. The mortality is as high as 90% in patients with neurological involvement, but only 20% in those with abdominal symptoms alone. The treatment of an acute attack of porphyria is largely supportive. The histories of two patients are presented, both of whom underwent laparotomy before the diagnosis of porphyria was made.

Bone Sarcoma Following Irradiation.—A 12-year-old boy was given roentgen irradiation to the right distal femoral epiphyseal plate to retard the normal growth of the right lower extremity. This was intended to compensate for shortening of the left lower extremity following poliomyelitis. A total of 3,200 r was applied to this region, and 11 months later an additional 3,600 r was given. Roentgenograms were made several times during 1948 and 1949. They revealed no abnormalities, but genu valgus and shortness of the left leg persisted. Four years after irradiation the patient complained of a painful tumor on the medial aspect of the right femoral distal metaphysis, which had been present for two weeks. Roentgenograms now showed a destructive proliferative bone lesion suggestive of osteogenic sarcoma. A frozen section of the lesion showed evidence of malignancy. Inasmuch as irradiation is known to produce leukemia in the myeloid tissue and is conducive to epithelioma in heavily irradiated skin, it is probable that sarcomas that develop in bone following heavy irradiation are a comparable reaction. The author cites similar reports from the literature.

Annals of Allergy, Minneapolis

10:397-534 (July-Aug.) 1952. **Partial Index**

Some Investigational Studies Concerning Reactions to Insect Bites. E. M. Rockwell.—p. 404.

Papular Urticaria: Its Relationship to Insect Allergy. B. Shaffer, C. Jacobson and P. P. Pori.—p. 411.

Place of Allergist in Medical Education and Public Welfare. H. S. Baldwin.—p. 422.

*Nitrogen Mustard in Treatment of Bronchial Asthma. G. L. Waldbott. —p. 428.

Soy Bean Milk as Substitute for Mammalian Milk in Early Infancy; with Special Reference to Prevention of Allergy to Cow's Milk. J. Glaser and D. E. Johnstone.—p. 433.

Hormonal-Connective Tissue Mechanism in Allergy. A. G. Rawlins. —p. 440.

Studies of Capillary Resistance in Allergic States. I. Gothlin Index in Allergic Disease. H. Sherman, T. D. Cohn and J. Sherman.—p. 445.

Comparative Study of Effects of Certain Antihistamines on Skin Reactivity. I. A. Fond.—p. 449.

Use of Histamine in Treatment of Allergic Diseases. H. D. Jonez. —p. 454.

Technique for Minimizing Severe and Constitutional Reactions when Administering Allergenic Extracts Subcutaneously. N. E. Silbert. —p. 465.

Treatment of Bronchial Conditions with Combination of Anticholinergic, Adrenergic, and Antihistaminic Drugs: Preliminary Report. N. E. Silbert.—p. 469.

Multiple Antihistamine Therapy: Preliminary Investigation. N. Shure, J. J. Sievers and M. C. Harris.—p. 473.

Nitrogen Mustard in Treatment of Bronchial Asthma.—Waldbott was induced to try nitrogen mustard in asthma, because Jiménez-Díaz had observed that in rheumatoid arthritis and asthma intravenous injections of nitrogen mustard produced effects similar to those obtained by cortisone or corticotropin. All patients whom Waldbott selected had been under treatment for asthma for several months or years and had been chosen because their disease had been unusually intractable. All patients had had eliminative procedures, hyposensitization, and symptomatic treatment. The majority had had one or more courses of cortisone, corticotropin, or both. Nitrogen mustard was given intravenously in doses of 0.1 mg. per kilogram of body weight on four successive days. There were 21 patients with severe intractable allergic asthma and four with chronic atopic eczema. All but four of the patients improved temporarily following this treatment. In many respects the effect of this drug parallels that of cortisone and corticotropin, but severe nausea and vomiting is a common side-effect and may necessitate interruption of treatment. The use of nitrogen mustard is contraindicated in pregnancy, because of a possible harmful effect on the offspring, and in patients with a tendency to hemorrhagic diathesis or leukopenia, because these conditions might be aggravated by the nitrogen mustard.

Annals of Surgery, Philadelphia

136:193-336 (Aug.) 1952. **Partial Index**

*Return of Function After Complete Transection of Spinal Cord of Rat, Cat and Dog. L. W. Freeman.—p. 193.

Observations on Spinal Nerve Root Transplantation in Male Guinea Baboon. L. W. Freeman.—p. 206.

*Comparative Study of Subtotal Gastrectomy With and Without Infra-Diaphragmatic Vagotomy in Surgical Therapy of Duodenal Ulcer. L. J. Druckerman, V. Weinstein, P. Klingenstein and R. Colp.—p. 211.

Cysts of Adrenal Glands. F. H. Ellis Jr., C. J. Dawe and O. T. Clagett. —p. 217.

Use of Viably Preserved Tissue for Homologous Arterial Grafts. E. C. Pierce II.—p. 228.

Splenic Studies: I. Susceptibility to Infection After Splenectomy Performed in Infancy. H. King and H. B. Shumacker Jr.—p. 239.

Acute Appendicitis in Children. J. M. Deaver.—p. 243.

Brain Hemorrhage After Carotid-Jugular Anastomosis: Implications of Changes in Walls of Blood Vessels. I. M. Tarlov and D. Grayzel. —p. 250.

Enzymatic Debridement of Necrotic Surfaces. S. L. Teitelman, D. Movitz and L. M. Zimmerman.—p. 267.

Some Unusual Manifestations of Regional Enteritis and Their Surgical Management. A. Hurwitz and A. Zovickian.—p. 278.

Intrathoracic Duplications of Alimentary Tract Communicating with Small Intestine. J. E. Davis and W. A. Barnes.—p. 287.

Congenital Cystic Disease of Lung in Newborn: Report of Successful Left Lower Lobectomy in Seven-Day-Old Infant. F. B. Whitesell Jr. and W. J. White.—p. 299.

Transplantation of Tibia and Fibula to Replace Femur Following Resection. G. G. Dixon.—p. 309.

Islet Cell Carcinoma of Pancreas: Report of Survival of Eight Years. J. W. Nadal.—p. 313.

Phrenic Rebound Phenomenon—New Physical Sign. E. Hoffman.—p. 316.

Volvulus of Cecum: With Report of Two Cases. D. L. Dean.—p. 319.

Successful Progressive Massive Resection of Small and Large Bowel for Mesenteric Carcinomatous Metastases. D. Stetten and H. A. Weinberger.—p. 326.

Substitute Bladder After Pelvic Evisceration for Treatment of Radiation Necrosis. D. S. Wenger.—p. 330.

Return of Function After Transection of Spinal Cord in Animals.—Although it has been generally accepted that spinal cord regeneration cannot take place in mammals, Freeman proved experimentally that functional regeneration is possible after surgical transection of the spinal cord in rats, cats, and dogs. This regeneration is due to the growth of neural elements, which, under the conditions of the experiments, were derived from spinal nerve cells rather than from spinal nerve root elements. The failure of regeneration in human subjects might be explained by the fact that, until recently, few patients survived spinal cord transection long enough for regeneration to occur. Furthermore, massive infection and severe catabolic changes precluded regeneration, and when such patients had been brought to the anabolic state, scarring within the spinal cord was so advanced that delayed regenerative efforts would meet an impassable barrier of scar tissue. The growth of the neural elements would probably have to occur in the first three weeks in order to establish a functional connection. To facilitate this, catabolic changes in the acutely injured patient would have to be prevented, and the rate of growth of neural elements would have to be promoted and scar tissue would have to be reduced or properly aligned.

Subtotal Gastrectomy With and Without Vagotomy.—Vagotomy has been abandoned as a sole operation for duodenal ulcer, because its benefits were more than offset by the symptoms of prolonged gastric retention, which frequently required surgical correction. Furthermore, there was evidence that some chronic duodenal ulcers failed to heal or recurred. Severance of the vagus nerves to the stomach produces physiological changes, however, that promote peptic ulcer healing and prevent recurrences in many instances. A group of 322 consecutive patients with chronic duodenal ulcer were subjected to subtotal gastrectomy alone or to gastrectomy in combination with infradiaphragmatic vagotomy. While there were no surgical deaths, the combined operation added to the postoperative morbidity, as shown by the greater incidence of pulmonary complications, gastric retention, and diarrhea. Follow-up studies revealed that the differences in minor symptomatology in the two groups were not significant except that 10% of the patients subjected to the combined operation reported having diarrhea. There were two questionable and nine proved cases of recurrent ulcer disease in the gastrectomy group and none in the gastrectomy-vagotomy group. Test meal studies disclosed a greater percentage of patients with anacidity after gastrectomy and vagotomy than after gastrectomy alone. These results suggest that simultaneous vagotomy affords added protection against recurrent disease, but at the cost of an increase in postoperative morbidity. In order to avoid the latter disadvantage, it might be advisable to reserve vagotomy for the small number of cases in which jejunal ulcer develops after subtotal gastrectomy. There were 7 failures in a series of 18 cases in which vagotomy was done later, indicating that simultaneous vagotomy and subtotal gastrectomy is more effective than subsequent vagotomy. Once a patient has had an ulcer, recurrence is possible regardless of the type of therapy. Recurrent ulcers have been reported as long as 30 years after corrective surgery. The authors feel that results with the combined procedure are encouraging, and they plan to employ it in all cases in which the addition of vagotomy will not materially increase the operative risk.

Cancer, Philadelphia

5:215-428 (March) 1952. **Partial Index**

Granulosa- and Theca-Cell Ovarian Tumors: Prognosis. A. W. Diddle.—p. 215.
Evaluation of Bilateral Orchiectomy in Treatment of Carcinoma of Prostate. II. C. Rusche.—p. 229.
Cancer of Cecum. C. Costello.—p. 254.
Breast Cancer: Measurement of Effect of Treatment. R. E. Johnson.—p. 267.
Hormonal Therapy in Cancer of Breast. A. Segaloff, D. Gordon, B. N. Horwitt and others.—p. 271.
Primary Malignant Tumors of Nerve: Report of Eight Cases. I. Gore.—p. 278.
*Application of Cytology in Diagnosis of Cancer of Rectum, Sigmoid, and Descending Colon. G. M. Bader and G. N. Papanicolaou.—p. 307.
*Intraepithelial Carcinoma of Cervix: Cytohistological and Clinical Study. J. Scapier, E. Day and G. R. Durfee.—p. 315.
Wilms's Tumor in an Adult: First Reported Case Found Incidentally at Autopsy. E. V. Olmstead.—p. 324.
Behavior of Patients with Cancer of Pancreas. L. A. Kohn.—p. 328.
Relative Rates of Formation of New Leukocytes in Patients with Acute and Chronic Leukemias: Measured by Uptake of Radioactive Phosphorus in Isolated Desoxyribosenucleic Acid. E. E. Osgood, H. Tivey, K. D. Davison and others.—p. 331.
Clinical Observations on Use of Triethylenemelamine. E. D. Bayrd, J. M. Stickney, B. E. Hall and C. H. Watkins.—p. 336.
Treatment of Acute Leukemia with Anti-Folic Acid Compounds (Aminopterin and Aminoanfol). A. Sawitsky, N. D. Ritz, J. Jacobson and others.—p. 344.
Effect of 2-Chloro-2'-Hydroxydiethyl Sulfide (Hemisulfur Mustard) on Carcinomatosis with Ascites. A. M. Seligman, A. M. Rutenburg, L. Persky and O. M. Friedman.—p. 354.
Bronchogenic Carcinoma In Situ: Report of Case with Positive Biopsy, Cytological Examination, and Lobectomy. W. Umiker and C. Storey.—p. 369.

Cytological Studies in Cancer of Rectum and Colon.—This paper presents the results of a study of rectal and colon washings in detecting cancer of the rectum and lower intestinal tract. The normal cell structure as well as the abnormal findings are described on the basis of studies on 200 patients. Two different types of washings were used. The rectal washings done on asymptomatic patients and for lesions within the proctoscopic range were obtained with the use of a specially devised instrument. Colonic washings used for suspected lesions beyond proctoscopic reach were obtained by using isotonic sodium chloride solution as an enema. The series included 19 patients in whom cancer had been proved by biopsy or surgery. Of these, 18 had positive or suspicious smears. In the 19th case a lesion first reported as a benign polyp was later proved to be a malignant polyp. There were no false-positive reports. On the basis of the results obtained, the authors conclude that the cytological method as applied in these studies is a dependable diagnostic procedure.

Intraepithelial Carcinoma of Cervix.—The relationship between intraepithelial and invasive carcinoma has aroused great interest, particularly with regard to the cervix. The term intraepithelial carcinoma is synonymous with carcinoma in situ, preinvasive carcinoma, and mucosal carcinoma. Although intraepithelial carcinoma of the cervix is reported more frequently now than formerly, criteria for its diagnosis on smears or sections are not so well established as for diagnosis of invasive carcinoma. This paper presents studies on 31 cases of intraepithelial carcinoma that were detected among 10,800 new patients and 9,500 return patients. None of these patients had symptoms of carcinoma. In most of them carcinoma was first suspected on routine cytological smears and subsequently confirmed by biopsy. The average age of the group was about 47 years, and about 30% of these women were in the postmenopausal age. The cytological as well as the cytohistological changes are less marked in intraepithelial than in invasive carcinoma. The nucleus tends to be enlarged, is round or oval, and is hyperchromatic. In moderate hyperchromatism the nuclear content is still distinct and is characterized by an irregular distribution of the chromatin granules in dense clumps, by enlarged, prominent nucleoli, and by a thickened nuclear membrane. In marked hyperchromatism, the whole nucleus is a large dark mass, in which the nuclear membrane and the nucleoli merge with the chromatin and the nuclear content becomes indistinct. As a result of the nuclear enlargement, the nuclear : cytoplasmic ratio is increased. The staining properties of the cytoplasm remain normal. The cell margins are usually regular. Thus, the exfoliated cells of an intraepithelial carcinoma show malignant features only in the nucleus. The cells of the intraepithelial carcinoma have not lost their ability to differentiate. The cytological structure of the invasive type of carcinoma is also briefly described, and the cytological criteria of the two types are compared. The cytological aspects of smears are correlated with pathological studies on biopsies and surgical specimens and with clinical data. Trichomonas infection, pregnancy, estrogen therapy, and irradiation of pelvic organs are possible sources of error in the interpretation of cytological smears from the uterine cervix. The study of seven untreated cases in which smears indicated intraepithelial carcinoma and in which cytological follow-up studies were negative suggests the possibility of spontaneous regression.

Cancer Research, Chicago

12:535-614 (Aug.) 1952. **Partial Index**

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Studies on Biological Action of Malononitriles. I. Effect of Substituted Malononitriles on Growth of Transplanted Tumors in Mice. E. M. Gal, Fung-Haan Fung and D. M. Greenberg.—p. 565.
Nature of Mammalian Lymphosarcoma Transmission by Isolated Chromatin Fractions. G. Klein.—p. 589.
Effects of Application of Carcinogens to Exposed Gastric Mucosa in Rat. S. D. Kobernick, E. W. Toovey and D. R. Webster.—p. 591.
Studies on Inherited Susceptibility and Inherited Hormonal Influence in Genesis of Mammary Cancer in Mice. J. J. Bittner.—p. 594.
Standardized Nomenclature for Inbred Strains of Mice. T. C. Carter, L. C. Dunn, D. S. Falconer and others.—p. 602.

Diseases of Chest, Chicago

22:123-244 (Aug.) 1952

Simple Method for Determination of Vital Capacity—Time Relationships. M. S. Segal, J. A. Herschfus and M. J. Dulfano.—p. 123.
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Two Cases of Intra-Bronchial Foreign Bodies of Long Duration. J. M. Boettner, M. Rivero, M. A. Perito and others.—p. 219.
Spontaneous Hemopneumothorax: Report of Two Cases. W. H. Kastl. —p. 226.

Surgical Treatment of Pulmonary Valvulotomy.—Pulmonic stenosis may be associated with a variety of congenital cardiac vascular deformities, but it most frequently occurs in the tetralogy of Fallot or as an isolated anomaly. The stenotic area may involve the valve itself, the infundibular area, or occasionally both. In the tetralogy of Fallot infundibular stenosis occurs much more frequently than the valvular type. Valvular stenosis lends itself to surgical correction much more easily than infundibular stenosis. In the former type only incisions in the diaphragm-like valve are necessary, while in the latter type excision of muscular tissue at the point of narrowing is required. Most surgeons today use the method devised by Brock for dividing the stenotic pulmonic valve. This method consists of exposing the right ventricle through a left thoracotomy and passing a valvulotome through the wall of the right ventricle to engage the valve and divide it. Several different valvulotomes have been devised for this procedure. The original Brock valvulotomes are spoon-shaped instruments that have a probe-shaped tip on the leading end. Muller employed Brock's procedure, but for his later cases he devised a three-bladed cutting valvulotome, the blades of which could be expanded after they had been passed into the right ventricle. Six of seven patients with valvular pulmonic stenosis were benefited by operation by the Brock method. Cyanosis was present in two before operation. After operation it greatly diminished in one and disappeared in the other. Two had ventricular septal defects. The exercise tolerance in all of these patients increased. The systolic murmurs present before operation persisted after valvulotomy but were less intense. Diastolic murmurs did not appear in any of the patients. A seventh patient who was thought to have valvular stenosis with an interventricular septal defect was found at operation to have low infundibular stenosis. An infundibular chamber was present distal to the point of stenosis and was mistaken for poststenotic dilatation of the main pulmonary artery during the preoperative roentgenographic and fluoroscopic examination. The stenosis in this patient was of the diaphragm type. The valve was divided with the pulmonic valvulotome. Although the patient appears to be improved, insufficient time has elapsed since the operation to permit proper evaluation.

Indiana State Medical Assn. Journal, Indianapolis

45:765-864 (Aug.) 1952

Diagnosis of Early Gynecologic Malignancy. C. H. Hendricks.—p. 781.
Prolonged Antihistamine Action. M. H. Mothersill.—p. 786.
Practical Considerations in Fluid, Electrolyte, Acid-Base, and Protein Metabolism in the Surgical Patient. E. Marcus.—p. 790.
Review of Diagnostic Criteria of Ruptured Ectopic Pregnancy. E. L. C. Broomes.—p. 798.

Journal of Aviation Medicine, St. Paul

23:209-308 (June) 1952

Influence of Loud Speaking on Pulmonary Gas Exchange. F. G. Hall, J. W. Black, K. K. Neely and K. Hall.—p. 211.
Peripheral Circulation and Simulated Altitude. F. Girling and C. Maheux. —p. 216.
Some Factors Which Influence Protection Afforded by Pneumatic Anti-g Suits. E. H. Wood and E. H. Lambert.—p. 218.
Statistical Study of Relationship Between Ear and Response of Ear to Pure Tones and Whispered Voice. J. A. Sullivan and W. E. Hodges. —p. 229.
Operational Aviation Medicine. S. I. Brody.—p. 237.
Monocular Depth Perception in Flying. G. W. Rose.—p. 242.
Analysis of Oculogyral Effect. C. W. Mann.—p. 246.
Human Factors in Operations and Design of Aircraft. A. H. Lawton. —p. 254.
Objective Type Method of Measuring Flight Performance: Development and Evaluation in Naval Air Basic Training Command. W. R. Mahler. —p. 259.
Value of Protective Helmets in Aircraft Crashes. W. L. Jones.—p. 263.
General Practice of Training. L. S. Beals Jr.—p. 271.
Insects Collected from Aircraft Arriving in New Zealand During 1951. M. Laird.—p. 280.

Journal of Clinical Investigation, New York

31:751-806 (Aug.) 1952

Blood Pyruvic Acid Response to Intravenous Glucose or Insulin in Normal and in Patients with Liver Disease and with Diabetes Mellitus. D. S. Amatuzio, N. Shrifter, F. L. Stutzman and S. Nesbitt.—p. 751.
Metabolism of Pteroylglutamic Acid and Citrovorum Factor in Patients with Scurvy. G. J. Gabuzda Jr., G. B. Phillips, R. F. Schilling and C. S. Davidson.—p. 756.
Cardiac Failure Secondary to Ineffective Bellows Action of Chest Cage. J. A. Feltman, W. Newman, A. Schwartz and others.—p. 762.
Effects of Acute Anoxia on Circulation and Respiration in Patients with Chronic Pulmonary Disease Studied During "Steady State." A. P. Fishman, J. McClement, A. Himmelstein and A. Cournand.—p. 770.
Reactivity of Capillary Bed of Nailfold to Circulating Epinephrine and Nor-Epinephrine in Patients with Normal Blood Pressure and with Essential Hypertension. S. E. Greisman.—p. 782.
Thyroid Function in Nephrosis. L. Recant and D. S. Riggs.—p. 789.
Extrarenal Correction of Alkalosis Associated with Potassium Deficiency. R. E. Cooke, W. E. Segar, D. B. Cheek and others.—p. 798.

Journal of Nervous and Mental Disease, New York

116:95-188 (Aug.) 1952

Electroencephalogram in Electric Shock Therapies. J. G. Chusid and B. L. Pacella.—p. 95.
Carbon Dioxide Inhalation Therapy in Management of Psychoses: Preliminary Report. L. J. Liest.—p. 108.
Newer Techniques in Psychosurgery. J. P. Murphy.—p. 125.
*Critical Survey of 50 Spinal Fractures Due to Electric Shock Treatments. J. B. Funkhouser and H. W. Davis.—p. 131.
Statistical Analysis of 1,994 Veteran Patients. M. H. Adler and J. J. Michaels.—p. 138.
Guillain-Barré Syndrome. J. A. Di Fiore.—p. 146.
Hypnotherapy. E. Klemperer.—p. 157.

Spinal Fractures in Electric Shock Treatment.—A total of 4,070 shock treatments were given to 250 mental patients in a three year period. The average number of electric shock treatments per patient was 15. The dorsal spine was examined routinely in each case before and after treatment and whenever the patient complained of severe pain in the back. The authors believe that reports on the incidence of spinal fractures in electric shock treatments are unreliable unless roentgenograms are made both before and after treatment. Their own observations suggest that spinal fractures occur in about 20% of patients who receive electric shock treatments. Men are twice as likely to sustain these fractures as women. Furthermore, white men are more prone to sustain such fractures than Negro men, and young men more than older men. Fractures involved mostly the second to the eighth dorsal vertebrae, being most frequent in the third, fourth, and fifth. These fractures usually produce pain between and under the shoulder blades, which sometimes radiates into the shoulders and into the sternum. These pains, however, are not a reliable index of fracture, because 30% of these fractures occurred without pain, and many patients who did not have fractures complained of pain. The pain tends to disappear spontaneously.

Journal of Urology, Baltimore

68:413-546 (Aug.) 1952. **Partial Index**

Diagnosis and Treatment of Pheochromocytoma. C. A. Kuehn and J. N. Arthur Jr.—p. 413.
Intrarenal Gas: Report of Case and Review of Literature. G. A. Winstead.—p. 423.
Renal Papillary Necrosis: Case Report. A. Slipyan and S. Barland. —p. 430.
Infected Cyst of Kidney. C. M. Nelson and J. C. Hooper.—p. 437.
Echinococcus Disease of Kidney. W. Baurys.—p. 441.
Bilateral Ureteral Obstruction Due to Compression by Chronic Retroperitoneal Inflammation. J. M. Miller, R. J. Lipin, H. J. Meisel and P. H. Long.—p. 447.
Peri-Ureteral and Peripelvic (Renal) Extension of Carcinoma of Cervix: Case Report. S. J. Arnold and L. H. Baretz.—p. 452.
Vesico-Ureteral Reflux in Paraplegic: Cause and Correction. J. A. Hutch. —p. 457.
Podophyllin in Treatment of Human Adenocarcinoma of Bladder. R. G. Bunge.—p. 475.
Treatment of Epispadias: Report of 18 Cases. R. E. Gross and S. L. Cresson.—p. 477.
Urethral Rupture: Early and Late Posterior Complications. S. W. Mulholland and H. M. Madonna.—p. 489.
Urethral Stricture: Study of 227 Cases. R. L. Dourmashkin.—p. 496.
Treatment of Carcinoma of Prostate by Interstitial Radiation with Radioactive Gold (Au^{198}): Preliminary Report. R. H. Flocks, H. D. Kerr, H. B. Elkins and D. Culp.—510.
Radical Retropubic Prostatectomy for Tuberculosis. G. Friedmann, G. Shargel and H. Litvak.—p. 523.
Obturator Crush for Osteitis Pubis. M. Muschat, G. S. Leventhal and J. Krause.—p. 532.
Carcinoma of Scrotum: New Approach to Inguinal Gland Dissection. M. W. Coleman, R. Joyce and R. S. Graves.—p. 534.
Potentiality of Peritoneum as Dialyzing Membrane.—p. 539.

Metabolism, New York

1:197-290 (May) 1952

Review: Relation of Vitamin C to Adrenocortical Function and Stress Phenomena. C. L. Pirani.—p. 197.
Diabetic Acidosis. J. P. Peters.—p. 223.
Primary and Pituitary Myxedema: Clinical and Physiological Considerations. L. J. Soffer and J. L. Gabrilove.—p. 236.
Effect of Desoxycorticosterone Acetate on Electrolyte Metabolism in Normal Man. P. Fourman, E. C. Reifenstein Jr., E. J. Kepler and others.—p. 242.
Metabolism of Radioactive Cholesterol in Intact Rat. D. Kritchevsky, M. R. Kirk and M. W. Biggs.—p. 254.
Metabolic Studies in Pernicious Anemia. I. Nitrogen and Phosphorus Metabolism During Vitamin B_{12}-Induced Remission. G. W. James III and L. D. Abbott Jr.—p. 259.

1:291-382 (July) 1952

Metabolic and Clinical Effects of Corticotropin (ACTH) on Essential Glycogenosis (von Gierke's Disease). R. A. Ulstrom, M. R. Ziegler, D. Doeden and I. McQuarrie.—p. 291.
Serum Lipids and Lipoproteins in Diabetic Glomerulosclerosis. H. Engelberg, J. Gofman and H. Jones.—p. 300.
*Diabetes Detection Survey Among Male Physicians. I. A. Mirsky, P. Futterman, E. Rubenstein and D. E. Haft.—p. 307.
Metabolic and Clinical Effects of Different Regimens in Patients with Chronic Liver Disease. G. R. Morey, C. R. Paynter, C. F. Consolazio and R. M. Kark.—p. 314.
Blood Sugar and Food Intake in Rats with Lesions of Anterior Hypothalamus. J. Mayer, M. W. Bates and T. B. Van Itallie.—p. 340.
Role of Reticuloendothelial System in Vitamin A and Cholesterol Metabolism. H. Z. Brown, I. Philips and B. M. Kagan.—p. 349.
Effect of Pituitary Growth Hormone on Insulin Tolerance of Adrenalectomized Dog. S. S. Lazarus and B. W. Volk.—p. 355.

Diabetes Among Male Physicians.—A survey was conducted during the 1950 Diabetes Detection Week on 362 male and 22 female physicians comprising about 37% of the physicians of Cincinnati. The women were excluded from analysis because of their small number. Among the 362 men there were 4 with diabetes mellitus of many years' duration. A diagnosis of mild diabetes mellitus was made in only 2 of the remaining 358 with no previously known disturbance in carbohydrate metabolism, on the basis of moderately high blood sugar values on repeated study. The brief history obtained from each physician revealed that diabetes mellitus had been diagnosed in the parents, siblings, grandparents, aunts, or uncles of 109 (30.4%) of the 358 physicians. Further analysis revealed that 163 of the 358 physicians were Jewish, with a positive family history in 70 (42.9%), and 195 were non-Jewish, with a positive family history in 39 (20%). Greater awareness of familial illness may have been responsible for the magnitude of the positive family histories of diabetes reported by the physicians who presented themselves for this survey.

New England Journal of Medicine, Boston

247:191-226 (Aug. 7) 1952

Treatment of Frostbite with Particular Reference to Use of Adrenocorticotrophic Hormone (ACTH). W. W. L. Glenn, F. B. Maraist and O. M. Braaten.—p. 191.
Glomerulonephritis Associated with Atopic Dermatitis. K. Steiner. —p. 201.
Prevention of Thromboembolism in Acute Coronary-Artery Disease. D. Littmann.—p. 205.
Mental-Health Aspects of Civil Defense. D. L. Farnsworth.—p. 209.

247:227-270 (Aug. 14) 1952

*Laboratory and Clinical Studies on Erythromycin. T. H. Haight and M. Finland.—p. 227.
Early Treatment of Pulmonary Tuberculosis. C. W. Tempel and D. Clark. —p. 233.
Syndrome of Impending Hepatic Coma in Patients with Cirrhosis of Liver Given Certain Nitrogenous Substances. G. B. Phillips, R. Schwartz, G. J. Gabuzda Jr. and C. S. Davidson.—p. 239.
Utilization of Cholangiogram During Exploration for Biliary Atresia. O. Swenson and J. H. Fisher.—p. 247.
Importance of Coxsackie Viruses in Human Disease, Particularly Herpangina and Epidemic Pleurodynia. R. J. Huebner, E. A. Beeman, R. M. Cole and others.—p. 249.

Studies on Erythromycin.—Erythromycin is a new antibiotic produced by a strain of Streptomyces erythreus. Of 920 strains of bacteria, most of them recently isolated from patients with various infections, which were tested for sensitivity to erythromycin by a plate-dilution method, pneumococci and group A hemolytic streptococci were the most sensitive. Other streptococci, staphylococci, and Neisseria organisms were somewhat less sensitive, as were also the strains of Hemophilus and of diphtheria bacilli. Coliform bacilli, Proteus, and Pseudomonas organisms were all quite resistant. Many of these strains were also tested for sensitivity to penicillin, aureomycin, and terramycin. On a weight basis, the erythromycin was essentially similar in its activity to penicillin; it was more active than the broad-spectrum antibiotics against the gram-positive organisms, less active against the gram-negative coliform bacilli, and about equally active against strains of Hemophilus. Of 41 patients treated with erythromycin, 16 had pneumonia, 13 had acute hemolytic Streptococcus infections, 2 had staphylococcal infections, 3 were diphtheria carriers, 4 had gonorrheal urethritis, and 3 had nonspecific urethritis. The antibiotic was given by mouth in initial doses of 200 to 500 mg. and subsequent doses of 100 to 250 mg. every six hours. Most of the patients with pneumonia received 5 to 8 gm. of the antibiotic in four to eight days. The patients with streptococcal infections were given an average dose of 9 gm. in five-and-one-half days. Results showed that the clinical efficacy of erythromycin in the treatment of acute infections is similar to that of penicillin. The new antibiotic is active against penicillin-resistant staphylococci, though not in all cases, and does not seem to be as effective as penicillin in gonorrhea. To date, no toxic effects from oral therapy had been observed, except for vomiting in one patient. Because of the possibility that this agent will be of value in the therapy of certain acute infections resistant to other antibiotics, erythromycin appears to deserve further clinical trial.

247:271-304 (Aug. 21) 1952

*Arterial Hypertension—Therapeutic Effect of Cation-Exchange Resins. R. J. Gill and G. G. Duncan.—p. 271.
Bulbar Poliomyelitis. M. J. Fox, J. F. Kuzma and C. L. Junkerman. —p. 276.
Prognostic Significance of Epinephrine Test in Preoperative Patients. H. G. Steele and A. F. Stratton Jr.—p. 280.
Hypertrophic Pulmonary Osteoarthropathy Simulating Rheumatoid Arthritis: Subsidence After Pneumonectomy for Carcinoma. H. A. Frank. —p. 283.
Importance of Coxsackie Viruses in Human Disease Particularly Herpangina and Epidemic Pleurodynia. R. J. Huebner, E. A. Beeman, R. M. Cole and others.—p. 285.

Cation Exchange Resins in Arterial Hypertension.—Restriction of sodium intake lowers the blood pressure in many patients with hypertension, but the rigid restriction of sodium required is difficult to attain by dietetic measures because of the unpalatability of such diets. The use of cation exchange resins provides a new means of controlling the sodium content of the body, since these large, organic polymerized molecules are capable of absorbing sodium from ingested food and from the intestinal tract. The authors report observations on 38 ambula-

tory patients who were treated with cation exchange resins for from 4 to 10 months and who received in their diets from 1 to 3 gm. of sodium daily. An ammonium and potassium carboxylic cation exchange resin was used, the potassium being added to prevent depletion of body potassium. It was found that the resins are effective adjuncts to diets low in sodium content, but are not substitutes for them in the management of hypertension. With the resins, diets containing 1 to 1.25 gm. of sodium daily can be used instead of the levels of 0.2 to 0.5 gm. needed with diet therapy alone. Thus, dietary palatability and cooperation on the part of the patient are increased. Deficiencies in serum calcium and potassium, which sometimes occur as the result of this therapy, may be prevented by administration of calcium lactate and potassium citrate. This measure also lessens the tendency to hyperchloremic acidosis. Cation exchange resin and restricted dietary sodium therapy may be tried safely in a patient with essential hypertension if he has at least moderately good renal function as indicated by the urinalysis, the phenolsulfonphthalein excretion or urine concentration test, and the blood urea nitrogen determination.

New Jersey Medical Society Journal, Trenton

49:335-376 (Aug.) 1952

Allergic Reactions in Treatment of Varicose Veins. S. Z. Hawkes.—p. 338.
Isonicotinic Acid in Tuberculosis: Preliminary Report: Clinical Experiences. E. Witkind, I. Willner and O. Brandman.—p. 340.
Mesenteric Thrombosis with Survival. A. G. Merendino.—p. 343.
Depo-Heparin for Long Term Therapy of Myocardial Infarction. I. Sussman and E. Lydecker.—p. 344.
Diabetic Neuropathy. F. Fortuin and H. Wassing.—p. 347.
Office Management of Low Back Pain: Including Care of Industrial Back. H. H. Kessler.—p. 354.
Hereditary Hemorrhagic Telangiectasia: (Unusual Case History). A. Abraham and G. Yelin.—p. 358.
Slum Tuberculosis. I. Willner.—p. 361.

New Orleans Medical and Surgical Journal

104:561-602 (Aug.) 1952

Mediastinal Tumors. J. D. Rives.—p. 561.
Surgical Repair of Hernia in Children. J. A. Hendrick.—p. 566.
What is Psychotherapy? T. L. L. Soniat.—p. 569.
Role of Physician in School Health Program. R. L. Simmons.—p. 574.
Head Pain of Nasal Origin. J. R. Anderson and W. Rubin.—p. 578.
*Development of Bleeding Gastric Ulcer in Child with Acute Rheumatic Fever Treated with ACTH and Cortisone. C. L. Busby, J. H. Shipp, E. B. Harris and others.—p. 583.
Ectopic Ureteral Orifice: Report of Five Cases. H. A. O'Brien and J. D. Mitchell Jr.—p. 585.
Treatment of Carcinoma of Bladder. J. G. Menville.—p. 590.

Gastric Ulcer in Child Following Treatment with Corticotropin for Rheumatic Fever.—Gastric ulcer in a 12-year-old boy following treatment with corticotropin (ACTH) and cortisone for acute rheumatic fever is reported. Treatment was begun with cortisone given intramuscularly in doses of 50 mg. every 12 hours for seven days and was continued with the same dose given every 24 hours for five days. Corticotropin therapy then was started with doses of 25 mg. every six hours for three days and continued with 10 mg. every six hours until a total of 495 mg. had been given. The temperature had been restored to normal, but started to rise again after discontinuation of the drug. A second course of corticotropin was started with doses of 25 mg. every six hours; the dose was gradually reduced until a total of 820 mg. had been given. Temperature had been restored to normal on the third day of this course, and there was no further rise of temperature following discontinuation of the drug. Three weeks later the patient was readmitted to the hospital with fever and a sore throat. There were no joint manifestations and no cardiorespiratory complaints. Fever responded rapidly to penicillin, and temperature was restored to normal within 24 hours. On the fourth hospital day the patient vomited about 500 cc. of old and fresh blood. A small penetrating ulcer on the lesser curvature of the stomach in the region of the pyloric portion was demonstrated on roentgenologic examination of the gastrointestinal tract. The patient was discharged asymptomatic and was followed for three months without recurrence of any gastrointestinal or cardiorespiratory symptoms. Repeated roentgenologic examination of the stomach with barium showed complete healing of ulcer after therapy. Physical examination revealed only an enlarged heart, with a grade 3 systolic murmur heard best at the apex. This case illustrates the definite value of corticotropin in acute rheumatic pancarditis, but it also shows the danger of development of acute gastric ulcers, even in a young person. The acute ulcer may have been due to the pronounced increase of uropepsin excretion following use of pituitary adrenocorticotropic hormone. The depression of the growth of granulation tissue in wounds may have been an additional factor.

Northwest Medicine, Seattle

51:581-642 (July) 1952

Epinephrine Precursors in Control of Allergy. R. R. Widmann and J. D. Keye.—p. 588.
Voluntary Continuous Photofluorographic Tuberculosis Case Finding. F. B. Exner, J. R. Erwin, B. F. Francis and others.—p. 591.
Feeding the Premature. S. G. Babson.—p. 596.

Oral Surgery, Oral Medicine & Oral Path., St. Louis

5:799-912 (Aug.) 1952. **Partial Index**

*Healing of Eye Disease by Cure of Oral Foci. A. A. Knapp.—p. 799.
Actinomycosis and Fracture of Mandible. M. D. Gruber.—p. 809.
Chondromyxoma of Mandible. E. L. Sleeper.—p. 816.
Ameloblastoma of Mandible. F. T. Wallace, J. M. Morgan and E. M. Colvin.—p. 823.
Multilocular Radicular Cysts of Mandible. E. C. Armbrecht and W. A. Waterman.—p. 827.

Eye Disease Cured by Removal of Oral Foci of Infection.—Knapp emphasizes that blindness not caused by disorders primary in the eye is for the most part caused by dental and/or otorhinolaryngologic disease. The first case he cites to illustrate this was that of a man who complained that the sight in his left eye had greatly deteriorated recently. Examination revealed an early, central, low-grade chorioretinitis of the eye, with vision of 20/50. Palliative therapy was prescribed, and he was advised to see his dentist and an otolaryngologist. After a dental surgeon had extracted an infected tooth, the eye disorder was completely cured. The choroid and retina regenerated completely, and vision was 20/20. On the basis of additional case histories the author demonstrates that the otorhinolaryngologic regions should be examined in patients with eye lesions, and he points out that sinusitis is frequently the cause of ocular disorders. He stresses that improvement of keratitis, scleritis, and/or iritis subsequent to the removal of oral foci of infection has been observed too often to be coincidental. Cases are cited in which refractory keratoiritis, glaucoma complicated by acute iridocyclitis, and repeated and resistant retinal hemorrhages were improved following treatment of dental infections. Even in some cases of diabetic retinitis dental infection seemed to be a contributory cause.

Postgraduate Medicine, Minneapolis

12:101-190 (Aug.) 1952

The Ever-Continuing Search for Immunity in Tuberculosis. J. A. Myers.—p. 101.
Management of Breech Presentation. A. C. Barnes.—p. 124.
Herpes Zoster. P. Bailey.—p. 127.
Frigidity in Women. J. P. Greenhill.—p. 145.
Cumulative Effects of X-Ray Exposures. P. C. Hodges.—p. 152.
Some Practical Aspects of Lumbar Puncture. R. F. Courtin.—p. 157.
Medical Examination of Prostitutes. C. W. Clarke.—p. 162.

Public Health Reports, Washington, D. C.

67:709-828 (Aug.) 1952. **Partial Index**

Statistics in Administration of a State Health Department. J. D. Porterfield.—p. 741.
Administrative Value of Statistics to a Local Health Officer. B. F. Mattison.—p. 747.
The Medical Entomologist in Public Health. E. H. Hinman.—p. 755.
The Tuberculosis Problem. R. E. Teague.—p. 759.
Public Health and Medicine at the Crossroads. H. E. Hilleboe.—p. 767.
Age Aspects of Environmental and Occupational Cancers. W. C. Hueper.—p. 773.
Voluntary Reporting of Venereal Diseases—In Contacts Previously Reported Not Infected. B. H. Sklar, L. M. Schuman and N. J. Rose.—p. 780.
Drug Experience in Two Programs for Medical Care. H. Notkin, B. Rogerson, W. Davis and M. Taback.—p. 797.

Radiology, Syracuse, N. Y.

59:161-316 (Aug.) 1952

Roentgen Therapy in Vitreous Hemorrhage and Hemorrhagic Glaucoma. C. E. Hufford, F. C. Curtzwiler and J. L. Roberts.—p. 161.
*Extraperitoneal Pneumography. H. L. Steinbach, R. P. Lyon, D. R. Smith and E. R. Miller.—p. 167.
Some Obscure Factors in Production of Unusual Small Bowel Patterns. L. S. Goin.—p. 177.
Acute Fulminating Idiopathic Ulcerative Colitis: Report of Case Showing Unusual Roentgenologic and Clinical Features. K. L. McEwen and E. A. Lodmell.—p. 185.
Massive Fatal Embolism During Barium Enema Study. P. W. Roman, J. H. Wagner and S. H. Steinbach.—p. 190.
Syphilis of Stomach. C. Gottlieb, S. L. Beranbaum and M. L. Weiner. —p. 193.
New Technic in Study of Mucosal Pattern in Cardiac Area of Stomach. F. G. Capurro and J. C. Pecantet.—p. 198.
Aberrant Pancreatic Tissue in Gastric Antrum: Report of Seven Cases. M. Littner and I. Kirsh.—p. 201.
Hereditary Multiple Exostoses. J. D. Stark, N. N. Adler and W. H. Robinson.—p. 212.
Paradoxical Expiratory Ballooning of Hypopharynx in Siblings with Bilateral Choanal Atresia. W. M. Whitehouse and J. F. Holt.—p. 216.
Hodgkin's Disease: Statistical Report. R. W. Dickenhorst and W. H. Carroll.—p. 221.
Roentgen Therapy in Some Non-Malignant Conditions. S. J. Hawley. —p. 225.
Segmental Localization of Pulmonary Disease on Postero-Anterior Chest Roentgenogram. I. J. Kane.—p. 229.
Roentgen Doses During Diagnostic Procedures. V. W. Ritter, S. R. Warren Jr. and E. P. Pendergrass.—p. 238.

Extraperitoneal Pneumography.—In extraperitoneal pneumography gas is injected into the extraperitoneal areolar tissue as a contrast medium to demonstrate the viscera it surrounds. This procedure has been called "retropneumoperitoneum" by European investigators, but the name "extraperitoneal pneumography" appears preferable, since it indicates a diagnostic procedure, and organs, such as the liver and spleen, that are not retroperitoneal, may be examined by this means. The method was introduced by Ruiz Rivas. This paper is a progress report, Steinbach and collaborators having presented their first experiences with this method in September, 1951. The gas is injected into the areolar tissue between the rectum and sacrum, from which it extends into the cellular tissue of the entire body. Roentgenograms will demonstrate the uterus, uterine tubes, ovaries, kidneys, bladder, adrenals, liver, and spleen. With injection of a large quantity of gas, the structures in the mediastinum and neck may be outlined. A unilateral emphysema can be produced by introducing the gas with the patient in a lateral decubitus position. The method is simple, because it is relatively easy to insert the needle into the cellular tissue between rectum and sacrum. It is safe, because there are no large vessels in the retrorectal space, thus reducing the possibility of air embolus. The injection is not painful, and only one puncture is necessary to demonstrate both sides.

Southern Medical Journal, Birmingham, Ala.

45:677-778 (Aug.) 1952. **Partial Index**

Ocular Signs of Intracranial Vascular Accidents and Injuries. A. N. Costner.—p. 677.
New Technics in Nerve Blocks as Suggested by Radiographic Visualization. J. C. Appleton.—p. 681.
Rational Treatment of Os Calcis Fractures. F. C. Hodges.—p. 684.
Facial Lesions of Interest to General Practitioner and Plastic Surgeon. W. M. Adams and J. H. Hendrix Jr.—p. 689.
Role of Lobotomy in Psychiatric Management. D. C. Wilson.—p. 695.
Logical Employment of Sigmoidoscopy and Roentgenologic Examination in Studies of Colon. W. L. Cooper.—p. 698.
Effect of Lymph Node Metastases on Prognosis for Carcinoma of Cervix and Vulva. A. I. Sherman and R. M. Ruch.—p. 703.
Postpartum Hematomata. H. B. McNally and D. Ehrlich.—p. 708.
Complicated Peptic Ulcer. P. S. Kline.—p. 713.
Etiology and Treatment of Hepatic Coma. R. A. Wise.—p. 716.
Special Considerations in Diagnosis and Management of Genitourinary Tuberculosis. P. L. Getzoff.—p. 723.
Comparative Clinical Study of Naturally Derived and Synthetic Oxytocic Drugs of Ergot Origin. H. G. Hamilton, R. S. Higgins and W. S. Alsop Jr.—p. 728.
Cortisone in Rh Incompatibilities. O. B. Hunter Jr. and J. B. Ross. —p. 732.
Leukopenia and Granulocytopenia Developing During Course of Treatment with Cortisone. J. E. Stevens and E. C. Toone Jr.—p. 738.
Penicillin Suppository Treatment of Vulvovaginitis in Children. C. C. McLean.—p. 741.
Fluoridation of Public Drinking Waters. J. W. Knutson.—p. 748.
Trends Influencing Postgraduate Medical Education. R. L. Pullen.—p. 755.
Methods of Financing University Hospitals. R. O. Cannon.—p. 764.

Stanford Medical Bulletin, San Francisco

10:135-214 (Aug.) 1952. **Partial Index**

Public Health Aspects of Late Latent Syphilis. C. W. Barnett.—p. 152.
Cat Scratch Fever. H. Gifford, M. Brockbank and J. Mohrman.—p. 157.
Phase Microscopic Study of Fixed Stained Specimens. L. J. Rather and A. T. Brice.—p. 173.
Effect of Various Anterior Pituitary Fractions on Amino Acid Concentration of Blood. J. M. Luck, A. C. Griffin and A. P. Rinfret.—p. 179.
Treatment of Selected Dermatoses with Crystalline Trypsin Ointment. E. M. Farber, H. G. Loeb, J. McCleary and C. A. Lincoln.—p. 186.
Prevention of Breast Engorgement. R. W. Noyes.—p. 188.
Treatment of Gastrojejunal Ulceration. R. Cohn and C. Mathewson Jr. —p. 191.
Berylliosis: Case Report. J. W. Kasch.—p. 195.
Technical Improvements in Intestinal Anastomoses. E. Holman and J. E. Connolly.—p. 196.

U. S. Armed Forces Med. J., Washington, D. C.

3:1119-1240 (Aug.) 1952. **Partial Index**

Duodenal Ulcer in Military Personnel: Studies on Military Effectiveness of Ulcer Patient: III. Review of 350 Cases of Recurrent Duodenal Ulcer. E. D. Palmer, B. H. Sullivan Jr. and E. L. Hamilton.—p. 1123.
Vagotomy in Treatment of Peptic Ulcer. J. W. Humphreys Jr. and J. H. Forsee.—p. 1135.
Amputations and Recent Developments in Artificial Limbs. T. J. Canty. —p. 1147.
Treatment of Acute Rheumatic Fever with ACTH. C. E. Shopfner and M. Seife.—p. 1153.
Reflux Blood in Gallbladder. D. D. Greene, L. Marroquin and S. J. Thomas Jr.—p. 1179.
Diphtheria Simulating Peritonsillar Abscess and Complicated by Myocarditis. F. S. Glazener, A. K. Brown and T. W. Mattingly.—p. 1187.
Group Psychotherapy in Naval Neuropsychiatric Center. E. L. Wolfe. —p. 1195.
Meningitis and Hepatitis Due to Infectious Mononucleosis. M. Herman. —p. 1205.
Medical Debridement by Enzymatic Action. B. F. Chandler.—p. 1209.
Influence of p-(di-n-propylsulfamyl)-Benzoic Acid on Excretion of Uric Acid. F. W. Pitts and J. S. Chambers.—p. 1219.
*Prevention of Skin Damage by Sunlight. C. D. Bell and W. F. Mazzone. —p. 1225.
Bronchiectasis as Source of Massive Pulmonary Hemorrhage. R. T. Gants and J. M. Cuthbertson.—p. 1233.
Pregnancy with Sickle Cell Anemia and Placenta Accreta. R. D. Anspaugh, E. C. Rost and J. W. Cleary.—p. 1239.

Skin Damage by Sunlight and Its Prevention.—Repeated overexposure to sunlight is an occupational hazard for naval personnel. The authors prefer the term heliodermatitis to what is sometimes referred to as "sailors skin." It is seen chiefly in the habitually uncovered areas of the body. A peculiar mottled bluish whiteness appears on the lower lids, cheeks, lips, backs of the hands, or other areas. This background is etched by tiny, dilated blood vessels. As exposure continues, the telangiectases multiply. The skin becomes thin, lax, and without luster, except on the back of the neck where it is markedly thickened. Here the wrinkles deepen into furrows. Eventually small scaling patches appear, which in time become indurated papules which are senile keratoses and have the potentiality of becoming prickle-cell epitheliomas. A basal-cell epithelioma may be present as a papule or nodule with a raised border and usually a crusted or ulcerated center. Persons prone to sunburn, especially those who blister, are most readily affected, and among these the most susceptible are the red-haired, freckled types. The actinic band of sunlight, around 3,000 A., is responsible for the damage to the skin. The authors discuss preparations that are used for the protection against sunlight, and say that *para*-aminobenzoic acid totally absorbs the ultraviolet light between 2,600 and 3,130 A. Because it has no action below 2,600 A., it will not prevent initial erythema, and because light above 3,130 A. is free to act, it will not prevent darkening of pigment already present. *Para*-aminobenzoic acid is not easily adaptable to common ointment bases because of its insolubility. The sodium salt of *para*-aminobenzoic acid, however, is readily soluble both in alcohol and water. The authors further describe how *para*-aminobenzoic acid can be combined with sodium and how sodium *para*-aminobenzoic acid can be incorporated into standard pharmaceutical preparations.

FOREIGN

Acta Haematologica, Basel

8:1-130 (Nos. 1 & 2) 1952. **Partial Index**

Agranulocytosis Due to Occurrence of Leukocyte Agglutinins (Aminopyrine and Cold Agglutinins). S. Moeschlin and K. Wagner.—p. 29.
*Influence of Vitamin B_{12} on Lead Porphyrinuria. O. Frank, V. Lachnit and A. Neumayr.—p. 42.
Experimental Studies with Cerebrospinal Fluid of Leukemic Patients. G. Rosenow.—p. 53.
Action Mechanism of Corticotropin (ACTH) on Eosinophilic Cell System. A. F. Essellier and K. F. Wagner.—p. 63.

Influence of Vitamin B_{12} on Lead Porphyrinuria.—Increased urinary coproporphyrin is a constant and early sign of lead poisoning. This sign is important in the diagnosis but also presents a therapeutic problem, since it is said to be related to a number of symptoms, particularly colic and neuritic symptoms. The favorable effects produced with liver extracts and the components of the vitamin B complex induced the authors of this report to try vitamin B_{12}. They present observations on 11 patients whose occupations involved exposure to lead. One of them, who showed the full clinical picture of lead intoxication, was hospitalized. The remaining 10 received ambulatory treatment. They were given 30 μg of vitamin B_{12} twice weekly by intramuscular injection. The elimination of coproporphyrin in the urine was determined at weekly intervals. Treatment with vitamin B_{12} normalizes porphyrinuria and prevents the excessive urinary excretion of coproporphyrin induced by mobilization of lead. This effect of vitamin B_{12} is believed to be the result of its catalytic action on hemoglobin synthesis, especially on the ribonucleotides and of its protective action on the liver.

Anales de la Facultad de Medicina de Montevideo

38:75-146 (March-April) 1952. **Partial Index**

Bronchopulmonary Agenesia and Hypoplasia. R. Rubio and S. Piovano.—p. 75.
*Kidney and Liver Function in Chronic Secondary Anemias. M. Ferrari, A. Navarro, C. Mendilaharsu and others.—p. 103.
Cholesteatomas of the Brain. R. Araña Iñiguez, J. B. Gomensoro, J. Medoc and others.—p. 117.
Plasmacytic Leukemia. R. A. Piaggio Blanco, P. Paseyro and A. Grille.—p. 141.

Functions of Kidney and Liver in Chronic Secondary Anemias. Disturbances due to anoxia vary in intensity according to the sensitivity to oxygen deprivation of the tissues affected. Nervous, renal, and cardiac tissues are profoundly sensitive to anoxia, showing its effects in changes directly related in severity to the rapidity with which the oxygen lack is produced; shock is the best example of the effect of rapidly developing anoxia or hypoxia. Chronic anoxia may also cause disturbances, but there is a fundamental difference between the kind of anoxia found in respiratory insufficiency and that found in anemia. Respiratory insufficiency is characterized by anoxic anoxia, that is, anoxia associated with low oxygen tension, while in anemia the oxygen tension is usually normal but the total supply to the tissues per unit of blood volume is reduced. Anoxic anoxia cannot be compensated for by an increase in the blood flow, but in anemia, even though the total quantity of oxygen per unit of blood volume may be less than one-third of normal, physiological adaptation tends to compensate for the deficiency. Acceleration of the heart rate, increased velocity of circulation, and increased oxygen utilization are the basic factors in the adaptation, and the oxygen-conductive power of the blood may remain so perfect that organic disturbances do not appear. Long-continued anemia or excessively low hemoglobin values, however, may cause organic disturbances even when the processes of adaptation are at their maximum. Kidney and liver function was studied in 12 patients with various types of chronic secondary anemia but with effective adaptation as shown by a lack of cardiovascular disturbances. Functional tests made when the anemia was severest and after treatment had resulted in cure or obvious improvement showed that renal function is affected in chronic anemia in two ways: (1) hemodynamic, resulting in diminution of glomerular filtration, which leads to a decline in urea clearance, and (2) anoxic, when the reduction in the hemoglobin is so great (one-third or more) that the functional capacity of the tubular epithelium is seriously compromised. Liver function, studied by various tests, was normal except for a low cholesterol level, which, however, seems to depend on a general metabolic disturbance and not on a functional hepatic deficit. Lack of impairment in liver function in chronic secondary anemia, even when severe and long continued, indicates that the essential factor in the oxygenation of liver cells is the tension at which the oxygen reaches them, rather than the total quantity of oxygen per unit of blood volume.

Archivos de Pediatría, Barcelona

2:537-672 (March-April) 1952. **Partial Index**

*Mild Form of Scarlet Fever. J. Medir.—p. 539.
Congenital Abnormality of Esophagus. L. Torres Marty and J. Llona Ramírez.—p. 547.
Endogenous and Exogenous Foreign Bodies in Respiratory Tract. R. Ramos and R. Poch Viñals.—p. 557.
Therapy of Infantile Eczema. E. Bassas Grau and M. Bassas Grau.—p. 619.
Ectodermosis Erosiva Pluriorificialis. S. Ferrer Pi.—p. 651.

Mild Form of Scarlet Fever.—During the last four years the mild form of scarlet fever has occurred more frequently than the typical form all over the world. The change of form is due to increased resistance of patients and diminished virulence of bacteria owing to administration of antibiotics to children as treatment of either previous infections or scarlet fever. In the mild form of scarlet fever, there are no prodromal symptoms. The usual early symptoms of the disease either do not appear or are mild and transient. Fever is moderate and usually disappears in three or four days, but slightly elevated temperatures may persist for a month. Exanthema may be lacking or be so mild that it is unobserved. A second febrile phase, with or without pharyngeal symptoms, often occurs two or three weeks after the exanthematic period. Desquamation may not occur or it may appear late. It is restricted to hands and feet. The blood is either normal or shows marked eosinophilia and leukocytosis. Nephritis is a frequent complication. It develops on the third or fourth week and is severer in children who are not kept in bed. Differential diagnosis from scarlatinal rubeola is difficult. However, in rubeola the blood shows a relative lymphocytosis, pathological lymphocytes, and plasma cells. Isolation of patients with mild scarlet fever is necessary as susceptible children may develop very acute forms of the disease. Treatment consists of rest in bed for at least one month, and administration of penicillin and gamma globulin for six or eight days. The patient is on a free diet with moderate restriction of salt. If nephritis develops, the treatment is that of nephritis of any other etiology. The immunity left by the mild form of scarlet fever is not permanent. The combined penicillin and gamma globulin treatment prevents recurrences of the disease and other complications. The immunity produced by the disease in patients who have the combined treatment is longer than that produced in patients who have penicillin alone.

British Journal of Social Medicine, London

6:161-204 (July) 1952. **Partial Index**

Some Epidemiological Aspects of Acute Rheumatism. D. Hewitt and A. Stewart.—p. 161.
Dysplastic Growth Differentials in Patients with Psychiatric Disorders: Studies on Morphology of Maturity. J. W. Lovett Doust.—p. 169.
*Association of Congenital Malformation of Heart with Birth Rank and Maternal Age. B. MacMahon.—p. 178.
Birth Weights of South African Babies. III. Seasonal Variation in Birth Weight. E. J. Salber and E. S. Bradshaw.—p. 190.
Relative Frequencies and Sex Distributions of Human Multiple Births. R. G. Record.—p. 192.
Incidence of Common Infections of Childhood. B. Benjamin and A. T. Gore.—p. 197.

Association of Congenital Heart Disease with Birth Rank and Maternal Age.—MacMahon collected information about all patients with congenital heart disease born in Birmingham over a 10 year period, and compared it with data from a control series representative of all births during the same period. The controls were selected by taking every two-hundredth name from the registers of live births and stillbirths. Data on birth rank and maternal age were recorded for 588 of 633 affected infants and for 1,086 controls. In the highest maternal age group (38-48)

the proportion of infants with congenital heart disease is significantly higher than that of controls, but the difference is considerably reduced and is not significant when known mongolian idiots are excluded from the affected. There is no definite association with birth rank. Diagnosis was confirmed at postmortem or operation in 239 of the 588 patients. Numbers of cases of any specific cardiac defect are small, and the only conspicuous associations with birth rank and maternal age are exhibited by: (1) patent ductus arteriosus, which is commoner in first births than in later births; and (2) septal defects, which are unduly common in children of older mothers. There was no evidence that the incidence of congenital heart disease is related to season of birth, locality of domicile, or maternal ill health during pregnancy.

British Journal of Surgery, Bristol

40:1-96 (July) 1952

*Primary Carcinoma of Third Part of Duodenum. K. E. Rogers, J. C. Goligher and E. R. Williams.—p. 1.
*Carcinoma of Duodenum. G. M. Lunn.—p. 5.
Carcinoma of Third Part of Duodenum: with Special Reference to Methods of Restoring Continuity after Resection. T. Dunhill.—p. 13.
Urological Complications of Excision of Rectum. P. C. Watson and D. I. Williams.—p. 19.
Meconium Peritonitis: Report of Case Due to Spontaneous Intra-Uterine Perforation of Transverse Colon, with Brief Review of Literature. M. N. Tempest.—p. 28.
Meconium Peritonitis. I. Forshall, E. G. Hall and P. P. Rickham.—p. 31.
Cavernous Sinus Thrombophlebitis: Review. R. E. Shaw.—p. 40.
Id.: Case Due to Penicillin-Resistant Organism. P. M. McAllen and R. E. Shaw.—p. 49.
Treatment of Perforated Peptic Ulcer: Comparison of Two Parallel Unselected Series. T. S. Heslop, A. S. Bullough and C. Brun.—p. 52.
Small-Bowel Obstruction Following Antecolic Partial Gastrectomy. F. A. R. Stammers.—p. 58.
Peptic Ulceration of Third Part of Duodenum: Associated with Islet-Cell Tumours of Pancreas. F. Forty and G. M. Barrett.—p. 60.
Intraventricular Rupture of Secondary Carcinoma of Thyroid with Probable Seeding into Spinal Meninges. D. Miller and J. Constance.—p. 64.
Haemangio-Endothelioma of Spleen. A. M. Abrahams and J. H. Hughes.—p. 68.
Double Aortic Arch Treated Surgically. A. L. d'Abreu, R. Astley and A. Parkes.—p. 70.
Simple Renal Cysts. S. Glaser.—p. 74.
Functional Intestinal Obstruction Without Obvious Antecedent Cause. V. Bonney.—p. 78.

Carcinoma of Third Part of Duodenum.—Primary carcinoma of the duodenum accounts for only 0.3% of all gastrointestinal carcinomas; not more than 12% of the recorded cases arise in the third part of the duodenum. The diagnosis of the condition usually is made only at laparotomy or necropsy. Two cases of primary carcinoma of the third part of the duodenum in a 64-year-old man and a 54-year-old woman, which were correctly diagnosed preoperatively, are reported by the authors. In both patients, the main symptom was profuse vomiting at intervals of from a few hours to several days; the vomitus contained bile and partly digested food. Some nausea and a sensation of epigastric distention preceded the vomiting and were relieved by it. Both patients had lost a considerable amount of weight, and in one the repeated vomiting had resulted in a dangerous degree of dehydration. No abnormality whatsoever could be detected on abdominal examination of the two patients. The actual site and nature of the high intestinal obstruction was revealed without difficulty by roentgenologic examination in one patient, but in the other, roentgenologic examination was reported as negative on three occasions. A fourth examination made during one of the spells of vomiting revealed the obstructive features clearly. It is emphasized that roentgenologic examination if necessary should be carried out when symptoms are maximal. Treatment was by resection and end-to-end or side-to-side anastomosis, which was accomplished without difficulty and followed by immediate recovery in both patients. One of them died of recurrence four years later; the other is alive and well one year after surgical intervention.

Carcinoma of Duodenum.—The occurrence of duodenal carcinoma is reported in two men and three women between the ages of 39 and 67. One had suprapapillary, three had peripapillary, and one had infrapapillary lesions. A positive diagnosis was made in two and suggested in one, the barium meal being the most valuable single measure in arriving at a correct preoperative diagnosis. A roentgenogram revealed no abnormalities in one patient despite the presence of a moderately large lesion. The fifth patient was not examined roentgenologically, as she had a complete obstruction. All patients were subjected to radical excision. The operations performed were a duodenectomy with reimplantation of the pancreas; a two stage pancreaticoduodenectomy with exclusion of the pancreas; a one stage pancreaticoduodenectomy, also with pancreatic exclusion; a total pancreatectomy and duodenectomy; and a segmental resection. One patient died following the second part of the two stage excision. The remaining four patients are alive without evidence of recurrence 8 months, 16 months, 6 months, and 26 months after operation. Results showed that a radical pancreaticoduodenectomy remains the treatment of choice for ampullary or near-ampullary lesions, with the possibility of a segmental resection for growth remote from the papilla of Vater. Whether the operation is performed in one or two stages is a matter of choice. Patients are more comfortable if the pancreatic secretion is returned to the alimentary tract by rejoining the pancreatic stump to the bowel. Evidence demonstrated that a number of peripapillary carcinomas are in fact growths of the duodenum and not of the common bile-duct as has been suggested previously. It is concluded that carcinoma of the duodenum is not the rare disease that it was formerly thought to be.

British Journal of Tuberculosis, London

46:131-192 (July) 1952. Partial Index

Psychological Aspects of After-Care in Pulmonary Tuberculosis. E. D. Wittkower.—p. 131.
Methods of Recording the Shape of Chest. H. R. E. Wallis.—p. 136.
Treatment of Persistent Tuberculous Pleuropulmonary Fistulae: Report of Five Cases. J. R. Belcher.—p. 141.
Displacement of Upper Oesophagus in Pulmonary Tuberculosis. C. P. Silver.—p. 150.
Chronic Pulmonary Heart Disease. S. Oram.—p. 153.
Enlarged Hilar and Paratracheal Glands Following B. C. G. Vaccination. L. D. Richards and L. Steingold.—p. 163.
*Tuberculous Pulmonary Infiltration as Sequel to B. C. G. Vaccination. T. James.—p. 166.
Incubation Period of Pulmonary Hydatid Cysts. S. C. Hawes.—p. 176.

Tuberculous Pulmonary Infiltration as Sequel to BCG Vaccination.—Mass vaccination against tuberculous infection by means of BCG is advocated in many parts of the world, but there is also a considerable opposition to BCG vaccination. The following complications may be directly attributable to BCG vaccination: regional lymphadenitis with or without cold abscess formation, erythema nodosum, phlyctenular conjunctivitis, or meningitis. James reports the case of a girl, aged 9 months, with a large swelling in the left axilla that had discharged spontaneously a yellowish-white material. The baby had been given BCG vaccination when she was about 7 months old because the father, six years earlier, had a diagnosis of active tuberculosis. The intradermal technique was used, over the left deltoid region. The initial vaccination was proceeding along expected lines, but in the axilla a swelling the size of a hen's egg was discharging a yellowish-white material. The swelling was a painless cold abscess of the axillary lymph nodes. No cervical lymph nodes were palpable. Clinical examination of the chest revealed no abnormality, but a radiological examination disclosed extensive infiltration of the upper lobe of the left lung and some collapse indicated by cardiac and mediastinal shift to the side of the lesion. Acid-fast bacilli were found in material from the abscess, but three gastric washings by direct examination and guinea pig inoculation failed to show the tubercle bacillus. The child remained asymptomatic except for the regional ulcer, which after six months had still not healed completely despite systemic and local treatment with streptomycin and *para*-aminosalicylic acid. Repeated chest roentgenograms showed no change until six months after the initial examination, when, for the first time, the infiltration of the left upper lobe showed signs of clearing and re-aeration, with a shift of the heart and mediastinum towards their normal positions. Eight months after the first examination the roentgenogram showed complete resolution of the lung lesions. It remains uncertain whether this pulmonary complication of BCG vaccination was the result of direct lymphatic spread from the vaccinated arm to the pulmonary lymphatics or indirectly due to pulmonary lodgement of the bacilli after hematogenous dissemination throughout the body.

British Medical Journal, London

2:245-298 (Aug. 2) 1952

*Comparison of Liver Extract and Vitamin B_{12} (Cyanocobalamin) in Maintenance Treatment of Pernicious Anaemia. E. K. Blackburn, J. Burke, C. Roseman and E. J. Wayne.—p. 245.
Year of General Practice: Study in Morbidity. J. Fry.—p. 249.
Sensitivity to Five Antibiotics of Strains of Staph. Pyogenes Isolated from Out-Patients. M. A. Birnstingl, R. A. Shooter and M. F. Hunt. —p. 253.
The Adolescent Feeble-Minded in Law and Practice. J. F. MacMahon. —p. 254.
Meconium Peritonitis Due to Hole in Foetal Intestinal Wall and Without Obstruction. A. W. Franklin and J. P. Hosford.—p. 257.
New Operative Method of Causing Thrombosis in Varicose Veins. A. J. Abraham.—p. 260.
Friction Injuries Following Road Accidents. C. C. Slack.—p. 262.
Disobliterative Endarteriectomy of External Iliac Artery. F. Forty. —p. 264.
Congestive Splenomegaly Due to Pancreatic Cystadenoma. A. Grunberg, J. L. Blair and C. A. St. Hill.—p. 265.

Comparison of Liver and Vitamin B_{12} in Pernicious Anemia.—Of 60 patients with pernicious anemia treated with vitamin B_{12} ("cyanocobalamin") for at least two years and maintained in good health by this treatment, 22 had been previously treated with liver extract for relatively long periods. A statistical analysis of the results obtained by the two methods of treatment in these 22 patients suggests an improvement brought about by the change to vitamin B_{12}. Only one patient showed a statistically significant decrease in the red blood cell count; 11 patients had a significant increase; no patient showed a significant decrease in hemoglobin concentration. One group of 10 patients had received injections of liver extract alone from the onset of the illness, while another group of 10 had received vitamin B_{12} alone. The group that received vitamin B_{12} showed significantly higher red blood cell counts and hemoglobin concentrations than the group that received liver extract. Three patients were strikingly improved by a change from liver extract to vitamin B_{12}; one relapsed because of too infrequent administration. Except for the last mentioned patient, all the patients treated with vitamin B_{12} remained well clinically. No evidence was observed of sore tongue, gastrointestinal disturbance, neurological involvement, or leukopenia. Macrocythemia may persist. Vitamin B_{12} injections are small in bulk, constant in potency, relatively cheap, and do not lead to sensitization. A maintenance dose of at least 50 μg. every two weeks is recommended for all patients with pernicious anemia without neurological involvement.

2:299-350 (Aug. 9) 1952

Surgery of Peptic Ulceration. H. Ogilvie.—p. 299.
Treatment of Massive Bleeding from Peptic Ulcer. A. G. Ogilvie, N. Cardoe and F. H. Bentley.—p. 304.
Malaria Eradication Scheme in Mauritius. M. A. C. Dowling.—p. 309.
*Superiority of "Camoquin" over Other Antimalarials. I. Singh and T. S. Kalyanum.—p. 312.
Observations on Methods of Measuring Erythrocyte Sedimentation Rate. A. Goldberg and H. Conway.—p. 315.
Salm. Typhi Osteomyelitis: Report of Case, with Review of Literature. J. Ferrier.—p. 318.
Paratyphoid B Osteomyelitis of Frontal Bone. E. Peyser and M. Madorsky.—p. 320.
Apparatus for Demonstrating Hazards of Static Electricity in Operating Theatres. K. C. Magee and A. Bracken.—p. 321.

"Camoquin" and Other Antimalarials.—Antimalarial therapy with various drugs was given to 339 soldiers between the ages of 16 and 35, 78 with pure falciparum malaria and 261 with vivax malaria acquired after a variable stay in endemic zones in India. None of the patients had been on suppressive treatment or had had any antimalarial drug before treatment was started. A total dose of 1 gm. (0.5 gm. at the onset of a chill and 0.5 gm. six hours later) of the dihydrochloride dihydrate of [4-(7-chloro-4-quinolylamino)-alpha-diethylamino-o-cresol] ("camoquin") was given to 15 patients with vivax malaria and 23 with falciparum malaria; a total dose of 2.5 gm. of chloroquine phosphate (1 gm. initially and 0.5 gm. 8, 24 and 48 hours later) was given to 15 patients with vivax and 2 patients with falciparum malaria. Chloroguanide (proguanil®) hydrochloride in doses of 100 mg. three times daily for 10 days was given to 79 patients with vivax malaria and double the dose was given to 10 patients with falciparum malaria. Quinacrine (atabrine®) hydrochloride in doses of 200 mg. three times daily for two days and 100 mg. three times daily for the next five days, was given to 171 patients. Combined treatment with 100 mg. of chloroguanide hydrochloride and 0.65 gm. of quinine three times daily for two days, followed by 100 mg. of chloroguanide three times daily for the next eight days was given to 17 patients. Combined treatment with 100 mg. of chloroguanide hydrochloride and 100 mg. of quinacrine hydrochloride three times daily for two days followed by 100 mg. of chloroguanide hydrochloride for the next eight days was given to seven patients. Results showed that "camoquin" is definitely superior to chloroguanide hydrochloride and quinacrine hydrochloride in the treatment of malaria. A combination of chloroguanide hydrochloride and quinine was better than a combination of chloroguanide hydrochloride and quinacrine hydrochloride or quinacrine hydrochloride alone. In falciparum malaria "camoquin" seemed to be superior to chloroquine hydrochloride in controlling fever and asexual parasitemia. In vivax malaria, fever was controlled earlier with "camoquin" but in a few cases there was a slight difference in the rate of clearance of parasitemia in favor of chloroquine hydrochloride. Evidence suggests that with larger doses of "camoquin" such as those used in the present series, relapses are few (2 of 38 patients), and are delayed. Although further experience is required to establish a worldwide superiority of "camoquin," especially over chloroquine hydrochloride, the use of a single dose and the smaller cost are distinct advantages.

Edinburgh Medical Journal

59:361-408 (Aug.) 1952

Acute Appendicitis. I. E. W. Gilmour and A. G. R. Lowdon.—p. 361.
Eosinophile Cells of Blood: General Review. R. D. T. Cape.—p. 374.
Bronchoscopy: Medical Diagnosis and Treatment. I. M. Farquharson. —p. 385.

Journal of Clinical Pathology, London

5:225-304 (Aug.) 1952. **Partial Index**

Primary Epithelial Tumours of Jaw. T. F. Hewer.—p. 225.
Lower Nephron Nephrosis After Transurethral Resection of Prostate. J. Swinney and B. E. Tomlinson.—p. 234.
Histological Changes in Hydantoinate Gingivitis. L. Crome.—244.
*Value of Rib Biopsy in Study of Marrow Disorders. M. S. R. Hutt, P. Smith, A. E. Clark and J. L. Pinniger.—p. 246.
Vitamin B_{12} Assay in Body Fluids Using Euglena Gracilis. G. I. M. Ross. —p. 250.
Relation Between Polyagglutinability of Erythrocytes in Vivo and Hübener-Thomsen-Friedenreich Phenomenon. J. Reepmaker.—p. 266.
Determination of Unsaturated Iron-Binding Capacity of Serum. S. Ventura.—p. 271.
Application of Haemaggiutination Technique to Study of Trichomonas Vaginalis Infections. M. G. McEntegart.—p. 275.

Rib Biopsy in Study of Marrow Disorders.—Obtaining marrow for diagnostic purposes by sternal puncture has certain disadvantages, and so Hutt and associates decided to use rib biopsy as an alternative method. The evaluation of normal variations and the selection and refinement of histological techniques were first undertaken on 50 ribs obtained at routine thoracotomies and at necropsy. Then the procedure was carried out on 10 patients for diagnostic purposes. The first three of these were given local anesthesia and the remainder general anesthesia because general anesthesia was more comfortable for the patient. The operation is carried out with surgical asepsis and lasts about 15 minutes. A portion of rib from ½ to 1 in. (1.2 to 2.5 cm.) long is removed from the midaxillary line according to the technique of subperiosteal resection. Smears are made from the marrow at one end of the rib either by direct impression or from particles removed with the scalpel. These are dried in air and fixed and stained as ordinary marrow aspiration films. The portion of rib is fixed for about 24 hours in 10% solution of formaldehyde and neutralized with excess calcium carbonate, after which it is frozen with carbon dioxide snow. When frozen solid the rib is cut with a fine-tooth saw in the plane of its long axis and the greater diameter of its cut surface. On the basis of their experience with rib biopsy the authors conclude that it is a more satisfactory procedure than sternal trephine in the study of obscure hematological disorders. For the staining of the sections the hematoxylin and eosin and van Gieson stains and an improved Leishman technique are recommended. The value of silver staining methods for demonstration of connective tissue fibrils is also stressed.

Krebsarzt, Vienna

7:197-260 (Aug. 1) 1952. **Partial Index**

Abnormal Biochemical Reactions. F. Seelich.—p. 197.
*Gastric Diseases in the Aged, with Particular Attention to Carcinoma of Stomach. G. Holler.—p. 205.
Treatment of Relapses After Cervical Carcinoma. H. Zacherl.—p. 210.
Testosterone in Treatment of Uterine Carcinoma. H. Husslein.—p. 219.
Contrasexual Hormone Therapy in Inoperable Genital Carcinoma. H. Tischer.—p. 224.

Carcinoma and Other Gastric Disorders in the Aged.—During the process of aging, the stomach undergoes changes. The thickness of its wall decreases, the musculature becomes weaker, and the mucosa becomes atrophic. Fatty degeneration of the muscle fibers is observed, and the glandular portions of the mucosa decrease, as does the capillary net. Other observers call attention to hypertrophy of the gastric musculature, particularly in the region of the pylorus. Aged persons may have an unusually large stomach without necessarily having digestive disturbances. Many have achylia gastrica in the absence of complaints about the stomach. The gastric achylia is often associated with a tendency to blood alkalosis, which may be a result of failure of the gastric glands. Both achylia gastrica and chronic gastritis are frequent in the aged, and both are factors which favor the development of gastric carcinoma. The author groups according to their ages 69 patients with gastric cancer, who were observed at his hospital between 1946 and 1951. Of these 41 were men and 28 were women; 37 were between the ages of 60 and 80. He stresses that all patients of the cancer age who seek medical aid because of stomach disorders should be thoroughly studied, if possible in a hospital, until cancer is ruled out. He discusses the symptomatology of gastric cancer, giving particular attention to the differentiation of cancer and ulcer.

Lancet, London

2:253-298 (Aug. 9) 1952

Therapeutic Trauma of Brain. P. M. Tow.—p. 253.
Action of Belladonna on Gastric Motility in Man. W. F. Anderson.—p. 255.
Treatment of Anogenital Pruritus. R. D. Sweet.—p. 258.
Incidence of Antibiotic-Resistant Staphylococci in Hospital. P. M. Rountree and E. F. Thomson.—p. 262.
Maintenance Therapy of Pernicious Anaemia with Vitamin B_{12}. D. A. Brewerton and R. A. J. Asher.—p. 265.
Further Outbreak of Bornholm Disease Associated with Coxsackie Virus. H. S. Bury and J. O'H. Tobin.—p. 267.
Intra-Articular Hydrocortisone Acetate in Rheumatoid Arthritis. G. D. Kersley and M. H. L. Desmarais.—p. 269.
Pancreaticogastrostomy. R. Ingebrigtsen and E. Langfeldt.—p. 270.
Recovery from Shot in Back of Neck. K. Varady.—p. 271.

2:299-346 (Aug. 16) 1952

Immunity to Viruses: General Discussion with Special Reference to Role of Allergy. W. I. B. Beveridge.—p. 299.
Exact Determination of Central Venous Pressure by Simple Clinical Method. J. G. G. Borst and J. A. Molhuysen.—p. 304.
Diagnosis of Mixed Parotid Tumours. D. H. Patey and B. H. Hand.—p. 310.
Serum-Antithrombin Level in Fibrocystic Disease of Pancreas. J. C. W. MacFarlane.—p. 311.
Local Use of Antibiotics in Chronic Suppuration of Middle Ear and Mastoid: with Particular Reference to Terramycin. P. E. H. Rutter and J. C. Ballantyne.—p. 314.
*Site of Action of Toxin in Local Tetanus. E. A. Wright, R. S. Morgan and G. P. Wright.—p. 316.
*Polyarteritis Nodosa After Thiouracil. P. G. Dalgleish.—p. 319.
Petrol Pneumonia. A. W. Husband and M. Gelfand.—p. 320.

Site of Action of Toxin in Local Tetanus.—Abel and co-workers expressed the view that in local tetanus the toxin acts peripherally at the myoneural junction. This conception is directly at variance with that proposed by Meyer and Ransom. This problem involves more than the mere mechanism of the intoxication in tetanus, for it also concerns the possible central transference of other noxious agents. Experiments performed by Wright and associates revealed that anesthesia induced by intravenous administration of pentobarbital (nembutal®) terminates the spasticity and exaggerated electrical activity of muscles in localized tetanus. This suppressive action has been found to take place even if the circulating anesthetic is prevented from reaching the affected muscles by the inflation of a pressure cuff on the thigh, which occludes blood vessels without interfering with the transmission of nerve impulses. The inference to be drawn from this finding is that in localized tetanus the toxin must have a central action, as Meyer and Ransom believed, and not an exclusively peripheral one, as Abel and his associates thought.

Polyarteritis Nodosa After Thiouracil and Iodine Therapy.—A woman with thyrotoxicosis developed polyarteritis nodosa while under treatment with thiouracil. The patient had been taking the drug for about four and a half months when an unusual rash developed, the legs swelled, and she became febrile and ill. This condition subsided when administration of thiouracil was stopped, only to recur in a severer form within days of resuming treatment. This picture is similar to that in patients observed by Foss, by Barnum, and by McCormick. The frank attack of polyarteritis developed in four out of five cases when thiouracil compounds were given for a second or subsequent course. This fact supports the belief that polyarteritis nodosa can be due to sensitization to various foreign substances. The woman whose history is presented here had also been given Lugol's compound solution of iodine for 14 days before the onset of symptoms. In view of a report by Rich of polyarteritis in a woman with thyrotoxicosis treated with iodine, the possibility of iodine as an etiological factor should perhaps be considered, the more so, since Barnum's patient also had received thiouracil together with iodine some weeks before the polyarteritis appeared.

Medical Journal of Australia, Sydney

2:77-108 (July 19) 1952. **Partial Index**

Role of A B O Incompatibility as Cause of Erythroblastosis Foetalis, with Report of Case. L. M. Bryce, R. Jakobowicz and E. K. Turner.—p. 77.
Chronic Rheumatic (Rheumatoid) Monarthritis. M. Kelly.—p. 79.
Response of Male Toad, Bufo Marinus, to Chorionic Gonadotropin and Use of Animal for Biological Assay. J. S. Wannan.—p. 83.
Mechanism of Results in Treatment with ACTH and Cortisone. W. J. McCristal.—p. 86.

2:109-144 (July 26) 1952

The Dog and the Shadow. F. K. Norris.—p. 109.
Abdominal Pain in Childhood. H. S. Patterson.—p. 115.
Abdominal Pain in Infancy. F. Arden.—p. 116.
Medical Causes of Abdominal Pain During Childhood. P. A. Earnshaw.—p. 117.
Abdominal Pain in Childhood from Surgical Angle. K. B. Fraser.—p. 120.
Megaloblastic Anaemia of Infancy. J. H. Colebatch and A. L. Williams.—p. 121.

Minerva Chirurgica, Turin

7:395-448 (June 15) 1952. **Partial Index**

*Artificial Anastomosis Between Jugular Vein and Carotid Artery in Treatment of Infantile Cerebral Paralysis. M. Battezzati and P. Durand.—p. 395.
Behavior of Glycemic Curve After Prefrontal Leukotomy. A. Pirovano and P. Confortini.—p. 397.
Gastric Function After Prefrontal Leukotomy. A. Pirovano.—p. 400.
*Treatment of So-Called "Soft-Tissue Sarcoma" with Particular Reference to Myectomy for Primary Sarcoma of Muscle. N. Berri.—p. 410

Anastomosis of Jugular Vein to Carotid Artery in Cerebral Palsy.—Anastomosis of the internal jugular vein to the common carotid artery was performed in a 5-year-old mentally retarded boy with a generalized spastic paralysis due to brain injury at birth. Electrocardiograms and blood tests were normal; no intracranial calcifications were seen on radiograms; and the sella turcica was normal. There were abnormalities in the electroencephalograms; the intelligence quotient could not be evaluated. The operation and the postoperative course were uneventful. On two follow-ups several weeks and four months after, respectively, the child seemed calmer and muscle rigidity had decreased. Movements were impaired by incoordination, and there was an aneurysmal dilatation of the jugular vein, with increased spinal fluid pressure, diastasis of the sutures, and poor general condition. There was no psychic improvement. The second patient in whom this operation was performed was a 3-year-old child with a brain disorder producing spastic paralysis. Arterial and spinal fluid pressures, electrocardiograms and radiograms were normal, whereas electroencephalograms revealed abnormalities. The anastomosis was performed without difficulty and without complication, but 10 hours later the child died. These poor results and those reported in the literature discourage

the performance of this operation in mentally retarded patients with cerebral palsy in an attempt to correct the impaired vascularization of the brain. Many times the severe psychic and motor conditions of the patients are aggravated by general and local complications.

Soft Tissue Sarcoma.—Soft tissue sarcoma is a malignant connective tissue tumor originating in the subcutaneous tissue, aponeuroses, intermuscular spaces, and muscles. Primary sarcoma of muscle at first remains completely within the muscle and develops along the interfascial and interfibrillar spaces. Tumors of the intermuscular spaces develop mainly along the interstitial and cellular tissue surrounding the neurovascular fascia. Surgery in these patients should be radical enough to eradicate all tumor-bearing tissue, and not only the site of origin and the anatomic development but also the histological type of tumor should be considered. For a sarcoma that is still entirely intramuscular a radical myectomy may be sufficient, whereas for a tumor developing along the intermuscular spaces even resection of entire groups of muscles may not be sufficiently radical. Amputation followed by dissection of the regional lymph nodes is necessary for round-cell sarcoma, even when this is still intramuscular, because this tumor, occurring typically in the young, is extremely malignant, metastasizes early through the blood and lymph streams, and involves the regional lymph nodes. Myectomy is indicated for early spindle-cell sarcoma and fibrosarcoma. Spindle-cell sarcoma occurring most frequently in the fourth decade, is less malignant than the round-cell tumor, metastasizes slowly only through the blood stream, and does not involve the regional lymph nodes. Fibrosarcoma occurs most frequently during the 5th decade, metastasizes only rarely, and does not involve the lymphatic system. The muscles in which sarcoma is found oftenest are the quadriceps femoris, the biceps and triceps brachii, and the gastrocnemius. An early symptom is the appearance of the tumor itself since at first it does not cause functional, circulatory, and nervous disturbances. At onset soft tissue sarcoma is difficult to differentiate from specific and nonspecific chronic inflammatory processes, benign tumors, and parasitic cysts; in its advanced stage it should be differentiated from syphilitic chronic myositis or nodular tuberculosis of the muscles. The diagnosis should be confirmed by biopsy. The author reports on eight patients with primary sarcoma of the muscles. Myectomy was performed in four of them for a fibrosarcoma, and in a follow-up after 5, 13, 3, and 8 years, respectively, there was no recurrences nor metastases. In the other four the sarcoma was too advanced or a first local excision that had not been radical enough had aggravated the patient's condition, and surgery was deemed impossible.

Monatsschrift für Kinderheilkunde, Berlin

100:349-388 (Aug.) 1952. **Partial Index**

Aureomycin in Treatment of Premature Infants with Dyspepsia. P. Paul. —p. 353.
*Treatment of Whooping Cough with Terramycin. K. Seelemann.—p. 359.
Acute Digestive Disturbances in Infants. A. Peiper.—p. 369.
Evaluation of Psychologic Test Methods in Childhood: Retelling of a Short Motion Picture Scene by Children. H. Albrecht and H. Kirchhoff.—p. 374.
*Alkali-Reserve in Acute Digestive Disturbances. R. Schmöger.—p. 380.

Terramycin in Treatment of Whooping Cough.—Fifty children, including 31 infants, with whooping cough were treated with terramycin. The drug was given orally in daily doses of 50 mg. per kilogram of weight (divided into four doses), and this dosage was continued for from one to two weeks. The results were excellent in about one-third of the patients and moderately good in another third. In the remaining third the treatment failed. These results were about the same as those obtained with aureomycin in another group of whooping cough patients. Like this latter drug, terramycin can be recommended for children who are seriously ill with pertussis because it may help to reduce the mortality, particularly in young infants.

Alkali Reserve in Acute Digestive Disturbances.—Schmöger points out that the term acidosis suggests that the pH of the blood and body fluids is below 7, but such a degree of acidity is not compatible with human life. The maximal range of fluctuation is between a pH of 7.3 and 7.8, that is, definitely in the alkaline range. In medical terminology the implication of acidosis is a deviation of the metabolism in the direction of acidosis. After briefly commenting on the technique of the determination of the alkali reserve, the author describes his observations in the course of 300 determinations in 126 infants with digestive disturbances. These included 54 with simple disturbances, 49 with subtoxic, and 23 with toxic digestive disorders. He detected a relationship between increasing reduction in the alkali reserve and the transition of abdominal to thoracic breathing. Studies on patients who were free from infection revealed that a blood leukocytosis and neutrophilia reflected a deviation toward acidosis in the acid-base mechanism. If a differentiation has to be made between pylorospasm and digestive disturbance with diarrhea and vomiting, a considerably reduced alkali reserve speaks for a digestive upset.

Nordisk Medicin, Stockholm

48:955-988 (July 11) 1952. **Partial Index**

*Bronchial Asthma: Diagnosis and Surgical Treatment. J. L. Hansen. —p. 959.
Etiology and New Treatment of Progressive Muscular Dystrophy. I. Persson.—p. 965.
Pyrogenic Properties in Exudates. G. Widström and J. Almgren.—p. 967.
Meduna's Carbon Dioxide Treatment in Psychoneuroses. E. Kiørboe and J. Fries.—p. 969.
Determination of Carbon Monoxide in Blood. T. Dalhamn.—p. 971.
Choreal Movements of Tongue in Dementia Paralytica. K. Rehtijärvi. —p. 972.

Surgical Treatment of Bronchial Asthma.—From 1944 to 1950, 75 patients with so-called intractable, nonallergic bronchial asthma were admitted to the thoracosurgical department of Øresund Hospital, after an average of eight previous hospitalizations, for consideration of surgical therapy. In 36 cases examination established other predisposing disorders that contraindicated neurectomy as the only intervention and often indicated other procedures or special treatment; in 13 cases there were localized disorders in lungs and bronchi, in 14 diffuse disorders in lungs and bronchi, in 4 heart disorders, and in 5 extrathoracic diseases. Hammen says neurectomy for bronchial asthma is chiefly considered in cases in which there are no other demonstrable affections or demonstrable allergy, the usual means of treatment have failed repeatedly, there is acute or chronic expiratory dyspnea, and there is apparently a bronchospastic cause. Poor general condition and slight or moderate cor pulmonale are not regarded as contraindications. High thoracic sympathectomy or pulmonary vagotomy was done in 32 of the 39 cases of pure bronchial asthma and in five additional later cases. The vagotomy was usually bilateral, and was performed in two sessions. Sympathectomy is technically somewhat more difficult and probably less radical, but it is the preferred method for older patients. Three of the 37 patients operated on died. Follow-up of the 18 patients treated with sympathectomy and the 12 treated with vagotomy after from one to eight years showed good results in seven and five cases respectively; eight of these cases were observed for over three years. The best operative results were attained when operation was performed in the earlier stages.

48:989-1020 (July 18) 1952. **Partial Index**

*Streptokinase and Streptodornase in Treatment of Hemothorax and Postoperative Empyema. J. Egense and O. Storm.—p. 992.
Anovulatory Cycles. P. Bergman.—p. 996.
Advisability of Routine Blood Transfusions in Operations. T. Nørholm-Pedersen.—p. 1005.
Meningopolyradiculitis After Tick Bite. H. Pakkenberg.—p. 1007.

Streptokinase and Streptodornase in Therapy of Hemothorax and Postoperative Empyema.—Injection of streptokinase and streptodornase in doses of 20,000 units and about 10,000 units respectively from six to forty-three days after operation gave good results in 18 out of 22 cases with hemothorax following extrapleural pneumolysis. If these enzymes are given earlier, there is danger of renewed bleeding, formation of bronchial fistula and wound rupture. After about the 45th day the coagulated blood is organized and cannot be broken down by the enzymes. In Egense and Storm's opinion the optimal time for the treatment is between the 10th and the 20th day after operation. The length of time from the administration of streptokinase-streptodornase till the coagulum disappears and the cavity is dry varies from 6 to 43 days, with an average of 21 days. Aspiration before and

after the injection and lavage with isotonic sodium chloride solution are important. No complications of note occurred. The results of the treatment should be followed by frequent roentgen examination. Ten patients with drained postoperative empyema were treated with streptokinase-streptodornase and antibiotics, with good effect in nine cases. The treatment should be started as soon as possible, with large doses (100,000 to 200,000 units of streptokinase and about 50,000 to 100,000 units of streptodornase).

Practitioner, London

169:111-212 (Aug.) 1952. **Partial Index**

Dual Responsibility in the Infertile Marriage. R. C. Brown.—p. 115.
The Male Factor in the Infertile Marriage. H. A. Davidson.—p. 126.
Cervical Factor in Fertility. H. H. F. Barns.—p. 133.
Clinical Methods of Determining Ovulation. M. H. Jackson.—p. 151.
Infertility Due to Coital Difficulties: Simple Treatment. J. Malleson. —p. 161.
Migraine: Its Mechanism and Treatment. F. G. Lescher.—p. 167.

Presse Médicale, Paris

60:1091-1106 (Aug. 2) 1952

*Percutaneous Carotid Angiography; Its Technique, Indications and Results. Study Based on 1,034 Injections. D. Petit-Dutaillis, B. Pertuiset and J. Rougerie.—p. 1091.
Procaine Penicillin G in Oil Gelled with Aluminum Monostearate in Syphilis. A. Vernes, J. Lacapère and P. Filhol.—p. 1093.

Percutaneous Carotid Angiography.—Percutaneous carotid angiography was performed on 746 patients by injecting a 45% solution of 3,5 diiodo-4-pyridone-N-acetate of diethanolamine into the common carotid artery. Since bilateral angiography was done in some cases, a total of 1,034 injections of the contrast medium were made between 1949 and 1951. Of the 746 patients, 78 had vascular lesions such as arterial and arteriovenous aneurysm, angioma, hematoma, and thrombosis of the internal carotid artery; 163 had cerebral tumors, 120 epilepsy, 49 meningeal hemorrhages, 95 vascular syndromes, 41 cranial trauma, 13 hydrocephalus, 47 psychic disturbances, 50 headache and vertigo, 11 isolated hypertension of the internal carotid artery, 30 ocular disturbances, 12 encephalitis, and 37 various other disorders. With the patient lying on his back and the head pronouncedly hyperextended in order to immobilize the carotid system and to bring it nearer to the surface, the injections were made after the skin, the adventitia of the carotid artery, and the superior cervical sympathetic ganglion were infiltrated with procaine hydrochloride. Four roentgenographic exposures were made, three in the lateral projection and one in the anteroposterior projection. Transitory side-effects were observed in only six patients (0.6%), two of whom had transitory hemiplegia, three with epilepsy had convulsions, one had transitory aphasia, and one with a tumor had his clouded state of mind aggravated. That does not include one patient who died after an intracarotid injection of procaine hydrochloride made in an attempt to relieve a refractory spasm; the procaine hydrochloride injection was the only cause of death. Angina pectoris, malignant arterial hypertension, diffuse arteritis or arteriosclerosis, and nontraumatic meningeal hemorrhage during its first eight days are contraindications to carotid angiography. As a result of their experience the authors state that arteriography is relatively innocuous and that it provides extensive information concerning the nature, site, and topography of vascular disturbances, tumors, intracranial hematomas, and many data that could never be obtained by ventriculography. The much larger number of undesirable effects and even deaths reported by other workers are to be considered as due to the technique used rather than the method itself.

Proceedings of Royal Society of Medicine, London

45:411-482 (July) 1952. **Partial Index**

Post-Partum Genital Tuberculosis. A. M. Sutherland.—p. 411.
Toxaemic Accidental Haemorrhage: Its Actiology, Phases and Treatment. O. Browne.—p. 414.
Retinal Vessels in Hypertensive Disease. R. Leishman.—p. 419.
Epidemic Follicular Eruption. R. E. Bowers.—p. 459.

Quarterly Journal of Medicine, Oxford

21:249-360 (July) 1952

*Hypopituitarism in Male Subjects Due to Syphilis, with Discussion of Androgen Treatment. M. H. Oelbaum.—p. 249.
Tumours Involving Brain-Stem: Study of 90 Cases Arising in Brain-Stem, Fourth Ventricle, and Pineal Tissue. H. J. Barnett and H. H. Hyland.—p. 265.
Acute Infectious Lymphocytosis. G. C. Arneil and I. D. Riley.—p. 285.
Pulmonary Complications of Influenza as Seen in Sheffield in 1949. D. A. J. Tyrrell.—p. 291.
Effect of Corticotropin in Rheumatic Fever. E. G. L. Bywaters and A. S. J. Dixon.—p. 307.
Follicular Lymphoma. G. Wetherley-Mein, P. Smith, M. R. Geake and H. J. Anderson.—p. 327.
Lymphangitis Carcinomatosa of Lungs. J. T. Harold.—p. 353.

Hypopituitarism Due to Syphilis.—During the last three years seven male patients who had hypopituitarism were studied and treated at a Manchester hospital. Two of these cases were of syphilitic origin, syphilis being congenital in one and acquired in the other. Caution is necessary in accepting the diagnosis of hypopituitarism and of syphilis, and only those with postmortem evidence should be regarded as definitely proved. Furthermore, the fact that syphilis and hypopituitarism are present in the same subject does not necessarily mean that the latter is due to syphilis, especially in women, in whom postpartum necrosis is so much more important as a causative factor. For this reason most of the work has been restricted to men. Of 37 male patients showing acute and chronic destructive lesions of the anterior pituitary, evidence indicated that syphilis was the etiologic factor in 14. The important data on these 14 cases are listed in a table. After describing and discussing the two cases observed by the author, the treatment of hypopituitarism is discussed, with particular emphasis on the value of androgens. Testosterone produces a retention of nitrogen, calcium, phosphorus, sulfur, and potassium in similar proportions to those in which they appear in the tissues. There is a direct metabolic effect on the tissues, without the intervention of the anterior pituitary or the adrenal cortex.

Revista Chilena de Pediatría, Santiago

23:135-178 (April) 1952. **Partial Index**

*Observations on 35 Cases of Spontaneous Pneumothorax in Children. J. Bauza, E. Rosenblüt and C. Alliende.—p. 135.
Determination of Blood Volume in Nurslings. O. Correa and I. Duque. —p. 145.
Intrahospital Development of Undernourished Infant Less Than One Year Old (Conclusion). J. Meneghello, H. Niemeyer, J. Rosselot and others.—p. 149.

Spontaneous Pneumothorax in the Child.—Pneumothorax may be spontaneous, traumatic, or therapeutic. Spontaneous pneumothorax may occur in previously healthy subjects or may follow various respiratory diseases, either acute (bronchitis, bronchopneumonia, or pneumonia) or chronic (bronchiectasis, pulmonary abscess, pulmonary neoplasms, mycosis, or active or cicatricial tuberculosis). Acute inflammatory processes are chiefly responsible for pneumothorax in infants and young children; weakness and eventual rupture of the alveolar wall may also result from incomplete development of the lung structure, common in infancy, or from congenital malformations. Pneumothorax secondary to an uncomplicated primary tuberculous infection usually runs a benign course, but when it occurs in caseous and ulcerocaseous tuberculosis, especially if bilateral, it is very grave, because the vital and functional capacity is already affected. The initial stage in such cases is frequently accompanied by pleural shock and may end in death. Stabilization, when it takes place, is seldom permanent; either the air is absorbed and the pleural fissure closes or the pneumothorax is complicated by an effusion, which may be serofibrinous and is often purulent. The resulting pleurisy may progress rapidly or become chronic. Treatment in uncomplicated cases may be limited to bed rest and measures to improve the general condition; surgical intervention may be required in more serious cases. The procedures to be used vary from simple drainage to lobectomy or even pneumonectomy. Antibiotics should always be used. Analysis of 35 cases of secondary pneumothorax in children treated in one year at the Hospital Roberto del Rio shows that 74.25% of the patients were less than 4 years old and 40% were less than 2. Acute pulmonary disease preceded

the pneumothorax in 26 cases; in the other 9 tuberculosis was the initial illness. Mortality among the children less than 4 years old was 100% for those with tuberculosis, and only 22.7% for the rest. Corresponding figures for children over 4 were 60% and 75%, respectively. The higher death rate among the older children with pneumothorax following acute pulmonary disease was probably due to the fact that they had severe general affections and extensive local involvement.

Revista Clínica Española, Madrid

45:145-220 (May 15) 1952. **Partial Index**

Post Cholecystectomy Syndromes. S. Carro.—p. 145.
*Treatment of Asthma with Nitrogen Mustard and Resulting Observations on Nature of Allergic Diseases and Therapy of Dysreaction. C. Jiménez Díaz, A. Merchante, J. Perianes and others.—p. 153.
Epidemic of Typhoid Fever in Málaga. J. Caffarena Solá and A. Gutiérrez Mata.—p. 158.
Chromocystoscopy in Diagnosis of Pyelonephritis. T. Pascual y Megías. —p. 178.

Treatment of Asthma with Nitrogen Mustard.—The similarities between the action of cortisone and corticotropin (ACTH) and that of nitrogen mustard prompted Jiménez Díaz and his co-workers to use nitrogen mustard in 17 cases of intractable asthma or prolonged status asthmaticus. Asthmatic symptoms disappeared completely in 11 patients; 3 were improved; and 3 were not affected. The improvement was followed in 35.2% by a relapse, which was in most cases less severe than the previous state; five patients remained well for 6 months, and three with a follow-up of from 10 to 14 months show no signs of ever having had asthma. Similar results have been obtained by the use of cortisone and corticotropin. The transient character of the improvement leaves the problem of the asthmatic patient unsolved except for a limited time during the acute phase, but the primary fact remains that the symptoms can be suppressed by bringing about a change of reaction even when the allergen is present. While in allergic diseases the antigen-antibody reaction is a mechanism by which symptoms are produced, it is not the only one and possibly not the primary one. Beyond it exists a basic dysreaction tendency, partly constitutional and genotypic in origin but affected by other factors such as climate, emotion, etc. The manner in which cortisone, corticotropin, and nitrogen mustard affect this mechanism is not clear, but they are known to be alike in antimitotic, lympholytic, and other properties which may operate to modify the allergic or hyperergic reactions.

Riforma Medica, Naples

66:645-672 (June 14) 1952. **Partial Index**

Indications for Surgical Treatment of Acute Pancreatitis. A. Ciminata. —p. 645.
Plasma and Blood Volume Determination with Spectrophotometer. U. Salera and G. Tamburino.—p. 648.
Cure of Early Tuberculous Infiltrate. F. Bider.—p. 650.
*Contribution to Knowledge of "Genuine Hypersplenomegalic" Forms of Lymphatic Leukemia. G. Pusateri.—p. 653.

Genuine Hypersplenomegalic Lymphatic Leukemia.—This term, coined by French authors, designates a rare atypical form of lymphatic leukemia that does not involve the lymph nodes but in which there is an excessive enlargement of the spleen. This condition, which responds to roentgen therapy, is reported in a 45-year-old man whose health had been good until four months previously, when a sudden pain in the left hypochondrium compelled him to quit work. Fever, bleeding gums, asthenia and anorexia followed, accompanied by increasing generalized pallor. All therapy failed, and the patient's condition became serious. He had an enlarged abdomen, mild signs of hemorrhagic diathesis, and pronounced dyspnea. His blood showed 2,800,000 red cells and 85,000 white cells per cubic millimeter. The spleen was greatly enlarged and biopsy revealed enormous numbers of lymphatic cells, mainly leukocytes, that did not come from the peripheral blood. There were few neutrophils and very few orthochromatic erythroblasts with a pyknotic nucleus. The lymph nodes and the bone marrow consisted mainly of cells of the lymphatic series. Roentgen therapy caused a decrease in the number of leukocytes to 48,000 and a decrease in the size of the spleen. However, despite this improvement, the patient died one month after admission. At first, myeloid leukemia was considered, but the enormous number of cells of the lymphatic series, the excessive enlargement of the spleen that responded to roentgen therapy, and the unimpaired condition of the lymph nodes justified diagnosis of "genuine hypersplenomegalic lymphatic leukemia."

Schweizerische medizinische Wochenschrift, Basel

82:737-756 (July 19) 1952. **Partial Index**

The Allergy Problem and Antihistamine Therapy Today. I. Noelpp-Eschenhagen and B. Noelpp.—p. 737.
*Combined Penicillin and Streptomycin Therapy in Subacute Bacterial Endocarditis. E. Haynal and L. Mosonyi.—p. 741.
Clinical Value of Measuring Specific Dynamic Action of Proteins. P. A. Bastenie and C. Tenzer.—p. 746.
Quantitative Determination of some Normal and Pathological Constituents of Urine with Compressed Tablets. W. Lanz.—p. 750.

Penicillin and Streptomycin in Subacute Bacterial Endocarditis. —Haynal and Mosonyi review observations on 113 patients with subacute bacterial endocarditis (79 men and 34 women) who were treated with antibiotics. In 90 cases only penicillin was employed and in the remaining 23 penicillin and streptomycin therapy was combined. The results obtained with penicillin alone improved steadily from 1946 to 1949, and the authors ascribe this to the increase in the penicillin dosage, particularly the daily doses. The combined use of penicillin and streptomycin, which was not begun until 1947, proved even more effective, producing cure in 22 of 23 patients. The combination therapy was usually carried out in the following manner: Daily doses of from 500,000 to 1,000,000 units of penicillin are given for at least four weeks. After that, although the patients usually have normal temperature, they are given 0.5 gm. of streptomycin twice daily, until a total of up to 20 gm. has been administered. Then penicillin therapy is resumed with daily doses of 500,000 units until the signs of cure become evident, such as regression of the splenomegaly and normalization of blood sedimentation in patients whose temperature has been normal for some time. This combination therapy required an average of nine weeks. To supplement the therapeutic effect of the antibiotics 470 blood transfusions were given to 59 patients. The authors gained the impression that the transfusions were helpful, although it could not be proved statistically.

Trans. Royal Soc. Trop. Med. and Hyg., London

46:371-464 (July) 1952. **Partial Index**

Animal-Man Relationship in Tropical Diseases in Africa. J. Carmichael. —p. 385.
Planning Control of Sleeping Sickness: Sequel. E. Akwei.—p. 437.
*Immunity to Yellow Fever Nine Years After Vaccination with 17D Vaccine. G. W. A. Dick and F. L. Gee.—p. 449.

Immunity to Yellow Fever Following Vaccination.—In 1941, more than 145,000 persons in the Toro district of Uganda were vaccinated with 17D yellow fever vaccine, which was prepared in the laboratories of the International Health Division of the Rockefeller Foundation, New York. This paper reports the results of an immunity survey made in November, 1950, more than nine years after the vaccination campaign. No epidemic of yellow fever had occurred in the areas concerned during the past nine years. It was found that at places where vaccinations had been done, 77.2% of the sample of persons of nine years and over were immune, while in the area where no vaccinations were done in 1941, 17.5% were immune. It is believed that a number of persons who had been vaccinated had migrated to the latter area, and that a number of nonvaccinated persons now lived in the area where vaccinations were done. In the vaccinated area there was a significant difference in the immunity rates in the samples of children of 9 to 15 years (63.2%) as compared with that of adult females of 16 years and over (82.8%). While this difference may indicate a difference in the response of young children as compared with older children and adults to vaccination, it seems more likely that it is due to an excess of nonvaccinated children having been included in one of the samples. The results of this study suggest that the validity of yellow fever certificates could be extended up to at least nine years after vaccination, except in the case of children who were less than 7 years old when vaccinated.

Ugeskrift for Laeger, Copenhagen

114:951-992 (July 17) 1952. **Partial Index**

Frequency of Hepatitis in Physicians. S. Madsen.—p. 951.
Retroperitoneal Pneumography According to Ruiz Rivas. E. de Fine Licht and E. Ratjen.—p. 955.
*Treatment of Gouty Arthritis with "Oxinofen" (3-Hydroxy-2-Phenylcinchoninic Acid). M. Iversen.—p. 960.
Treatment with 3-Hydroxy-2-Phenylcinchoninic Acid (Oxinofen) with Special Regard to Side-Effects. V. Rønnov-Jessen.—p. 962.
Rutin in Occult Melena in Older Persons. H. Simonsberg.—p. 971.

Treatment of Gouty Arthritis with "Oxinofen."—"Oxinofen" (3-hydroxy-2-phenylcinchoninic acid) was given orally to 14 patients with gouty arthritis, eight of whom had severe recurrent or chronic polyarthritis, and six of whom had monarticular disease. Eight patients had elevations of temperature. Only one patient was under 50. The dosage was 20 mg. per kilogram daily given in three doses at one hour intervals after breakfast, the duration of the treatment being from 2 to 11 days. Side-effects in the form of diarrhea and drug fever, observed after more than five days' treatment in three patients, aged 60, 66 and 77, disappeared following administration of fluid and salt. Iversen cautions against administering the substance to patients with renal or hepatic disorders. Exposure to sunlight during treatment should be avoided because of possible skin photosensitivity. As a rule definite improvement appeared during the first day of treatment, the acute changes generally subsided in two or three days, and the temperature became normal in the course of a couple of days. Treatment for four or five days seems to be adequate. "Oxinofen" was not found to exert any uricosuric effect.

114:1061-1086 (Aug. 7) 1952

Variations in Mortality from Cancer of Breast. O. Poulsen.—p. 1061.
*Chronic Cervicitis. R. Hammen.—p. 1066.
Treatment of Hemorrhoidal Tumors. T. Castberg and E. Hart Hansen.—p. 1073.
Results of Ambulant Treatment in 959 Cases of Anal Fissure. E. Fiehn.—p. 1077.
Bilateral Vasectomy Through One Scrotal Incision. J. Varnek.—p. 1079.

Chronic Cervicitis.—Signs of cervicitis were seen in 260 (60%) of 470 new patients treated in the gynecologic clinic of the Kommunehospital from April to July, 1950. The symptoms are discharge, dyspareunia, dysmenorrhea, and disturbances in menstruation. Hammen asserts that it is probably directly and indirectly the most important cause of sterility in women, and can be revealed as such by special examinations. The bacterial flora is apparently often only partly responsible for the origin of the disorder. Over half the patients with cervicitis have complications in the form of chronic parametritis and/or salpingo-oophoritis, and three fourths of the patients with chronic parametritis have visible signs of cervicitis. Chronic cervicitis plays an important part in the origin and continuation of all pelvic infections. Biopsy should be performed on suspicion. Patients with possible precancerous lesions should be referred to the specialist. Electrocauterization of the cervical canal was considerably more effective than other methods of treatment, including chemotherapy.

Union Médicale du Canada, Montreal

81:895-1012 (Aug.) 1952. **Partial Index**

*Report of Observations Based on 27 Cases of Surgical Treatment for Mitral Stenosis. P. David, E. D. Gagnion and O. Gialoreto.—p. 900.
New Method of Clinical Diagnosis: Electropherography of Proteins (Combined Techniques of Chromatography and Electrophoresis). J. Sternberg, R. Boucher and A. Proulx.—p. 908.
Considerations on 104 Cases of Sterility and One Case Followed by Pregnancy. S. Letendre.—p. 920.

Surgical Treatment of Mitral Stenosis.—One of 16 women and 5 of 11 men between the ages of 17 and 47 died during surgical treatment for mitral stenosis or the first postoperative days. This difference in the operative mortality rate of the two sexes may be explained by the greater readiness of the female patients to submit to surgical treatment at an earlier date before they had become completely incapacitated. The causes of death in the six patients were as follows: cardiac decompensation by the production of mitral insufficiency which the left ventricle could not tolerate; refractory paroxysmal tachycardia; hemorrhage in the course of surgical intervention resulting in cerebral ischemia and standstill of respiration; cerebral embolism in the course of surgical intervention with central ischemia and cessation of respiration after 16 hours; cardiac arrest during anesthesia; cerebral ischemia in the course of surgical intervention followed by respiratory arrest within 24 hours. Of the 27 patients operated on, 23 had sinus rhythm before the operation and 4 had auricular fibrillation; 3 of each group died. Auricular fibrillation thus seems to increase the operative risk. The authors believe that because of the experience gained on the patients reported on, the mortality rate will be reduced considerably in the future; in fact only 1 of the 16 patients died who were operated on for mitral stenosis after the present report was submitted for publication. Of the 21 patients who survived according to the present report and were followed up for 3 to 24 months, 17 were improved more than 50% and the remaining 4 were improved up to 50% with respect to symptoms and physical incapacity. Surgical treatment for mitral stenosis should never be practiced in the absence of a diastolic murmur at the apex of the heart, which is considered necessary for diagnosis. Left auricular hypertrophy, the presence of a considerably enlarged pulmonary artery, and an electrical axis of 75 degree or more will support the clinical diagnosis. The authors caution against surgical intervention on patients with an enlarged heart and with signs of true right ventricular insufficiency who are to be considered as having passed the stage in which surgical intervention may be effective. In the majority of the patients without calcifications the finger-fracture technique was employed successfully, while in the presence of calcifications commissurotomy with the knife gliding along the exploring index finger is to be considered necessary. At present a two finger enlargement of the mitral orifice appears to be adequate. Most of the operations did not require more than two hours and were completed with little loss of blood and minimal operative shock. Surgical treatment is the most effective therapy for pure mitral stenosis without regurgitation in an incapacitated patient. It often prolongs life and makes it more tolerable.

Wiener medizinische Wochenschrift, Vienna

102:547-582 (July 26) 1952. **Partial Index**

*Additional Experience with Thyroid Implantations in Diseases of Joints. F. Mandl and W. Gyri.—p. 550.
Preliminary Report on "Rigidyl" (β-diethylaminoethyl Benzohydryl Ether Hydrochloride) Therapy of Extrapyramidal Motor Disturbances. E. B. Hansen and H. Tschabitscher.—p. 551.
"Ventricular Tachycardia." O. Weinmann.—p. 554.
Organization of First Aid in Mines. H. Friehs.—p. 558.

Thyroid Implantation in Diseases of Joints.—Various diseases of the joints in 240 patients, 209 with chronic polyarthritis, 9 with spondylarthritis ankylopoietica (Bechterew's disease), 20 with spondylarthritis and 2 with sciatic pain, were treated by implantations in the abdominal wall of 5 gm. of thyroid tissue. Fresh thyroid tissue obtained from other patients by thyroidectomy was implanted in 176 patients, while dry preparations of thyroid tissue were implanted in 64. These dry preparations were made from tissue obtained by thyroidectomy and immediately frozen at a temperature of –4 F (–20 C). After 24 hours the tissue was placed in a dry-freezing apparatus and exposed to a vacuum of 0.1 to 0.5 mm. of mercury. Evaporation of moisture occurred rapidly and the thyroid tissue became free of water. It was then placed in sterile tubes, which were closed and protected against humidity. The tissue thus can be well preserved for a long time. Of the 240 patients, 210 (87.9%) responded satisfactorily to the treatment. Of the 240 patients, 10 had been treated previously and unsuccessfully by implantations of hypophysis. A satisfactory response to the implantation of thyroid tissue was observed in 8 of these 10 patients. Two patients had been treated previously with cortisone. The drug was ineffective in one, while a recurrence resulted in the other from too early discontinuation of the drug. Both these patients responded satisfactorily to the thyroid implantations. It was typical for all the patients, that exhaustion and pleasant fatigue, or occasionally increased pain in the joints, occurred within 8 to 12 hours after the implantation, while considerable improvement of pain and capability of movements was obtained within an additional 24 to 36 hours. Results of treatment were the same whether fresh or preserved tissue was implanted. Microscopic examinations of the implants performed on 100 patients did not reveal a definite relationship between the type of the implanted tissue and the positive result of the treatment. The authors consider their method as the cheapest and the most benign for endocrine therapy of diseases of joints.

BOOK REVIEWS

An Introduction to Pathology. By G. Payling Wright, D.M., F.R.C.P., Professor of Pathology, Guy's Hospital Medical School, University of London, London. Second impression. Cloth. $7.25. Pp. 569, with illustrations. Longmans, Green & Co., Inc., 55 Fifth Ave., New York 3; 6-7 Clifford St., London W.1, 1951.

In this book, Professor Wright has approached the study of disease with particular attention to etiology and to principles of pathology in their relationships to biology and physiology. He has been motivated to a considerable degree by the thought that, in the training of students in pathology, "there is a tendency for an increasing emphasis to be placed on its practical applications in diagnosis." In consequence, he believes that there is serious danger of overemphasis on the practical aspects of laboratory medicine "at the expense of an adequate understanding of the mechanisms that underlie disease processes." He has attempted, therefore, to provide medical students "not only with a knowledge of current practice, but also with an intellectual background which will enable them to make effective use of the advances of the future."

The author has succeeded admirably in his objectives. The style is lucid and concise, and the figures, charts, photographs, and photomicrographs are well chosen and beautifully printed. Unusual discriminative ability in generalization is evidenced in the correlation of new and old facts and ideas. Continued attention is given to the role of intrinsic factors in modifying the resistance of tissues, and the chapter on the inheritance of abnormalities is particularly stimulating. Especially helpful, also, is the index of names. This is a scholarly book that could be read profitably by every medical student. Moreover, it is an inspirational introduction that is well worthy of the traditions of pathology as a basic medical science.

A Handbook of Diseases of the Skin. By Herbert O. Mackey, F.R.C.S.I., L.R.C.P.I., D.P.H. Cloth. 7/6. Pp. 216, with 36 illustrations. C. J. Fallon, Ltd., 43 Parkgate St., Dublin, 1952.

Dr. Mackey believes that the increasing size and complexity of standard dermatology texts tend to discourage students from reading them. As a result, he has written this condensed guide to the clinical study and treatment of skin diseases. He admits that it is difficult to give an adequate account of even the commoner skin diseases in a small volume, but he has succeeded in condensing much useful information in the available space. Students and practitioners will find some chapters adequate for their purposes, while other chapters will require supplementary reading. The sections on general diagnosis and on principles of external therapy are especially helpful. The value of the book could be enhanced by increasing the number and improving the quality of the illustrations and by coordinating them more closely with the text. Good illustrations are essential in dermatological teaching, since so much of cutaneous diagnosis is visual. In addition, the table of contents could be made more informative and accurate. For example, the chapter on prurigo contains hidden within it descriptions of pruritus ani, lichen planus, and lichen simplex chronicus, and the chapter labeled pemphigus contains discussions of herpes zoster and dermatitis herpetiformis as well. The reader could find this material more easily and associate it more logically if these chapters were entitled "Itching Dermatoses" and "Vesicular or Bullous Dermatoses" respectively. Similarly exfoliative dermatitis is lost in a chapter entitled "Parapsoriasis," while the discussion of eczema is divided between two chapters, one labeled "Eczema" and the other "Industrial Dermatoses." The chapters on eczema could be made more useful by distinguishing more clearly between such clinical entities as atopic eczema, nummular eczema, dermatitis venenata, and infectious eczematoid dermatitis. Moreover, the statement that eczema is associated with acidosis might well be questioned. These points, however, do not detract from the essential worth of this volume as a whole.

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

The Merck Index of Chemicals and Drugs: An Encyclopedia for the Chemist, Pharmacist, Physician, and Allied Professions. Sixth edition. Cloth. $7.50; thumb-indexed, $8. Pp. 1167. Merck & Co., Inc., Rahway, N. J., 1952.

This book has been much in demand as a brief encyclopedia of chemicals and drugs for chemists, physicians, and pharmacists. It has been 12 years since the fifth edition was published, and in the past few years it has been impossible to obtain copies of this book. This is an improvement over the previous edition in almost all respects. There are more than 8,000 descriptions of chemicals, drugs, and minerals and more than 2,000 structural formulas. A typical description includes synonyms; chemical name; empirical and structural formula; molecular weight; per cent elemental composition; natural occurrence; synthetic method of preparation, with literature reference; brief physical and chemical composition; grades available; and medical and veterinary use, including toxicity, contraindications, and dose. At the beginning of this section there is a list of compounds designated by numbers or letters with reference to more appropriate names, for example, "T-1824, see Evans' Blue." Identification of compounds designated only by such numbers or letters is frequently difficult, and small as the list is, it is still welcome.

The list of chemical and clinicochemical reactions, tests, and reagents that occupied such a large proportion of the previous edition has been deleted. A section on organic "name" reactions has been added. There is a table of radioactive isotopes and a chart of those needed in medical therapy and diagnosis. The latter lists the form in which the radioactive medicine is applied, its use, dosage, and mode of administration.

In addition, numerous tables and charts covering miscellaneous items are in an appendix. Among these are a list of dyes certified by the Food and Drug Administration for foods, drugs, and cosmetics, a list of indicators, metric conversion tables, and a section on first aid in poisoning. This is one of the best books of its size for quick reference to technical and chemical data relating to medicinal products.

Anatomy for Artists. By Diana Stanley. Cloth. $3.75. Pp. 108, with 63 illustrations. Pitman Publishing Corporation, 2-6 W. 45th St., New York 19; Sir Isaac Pitman & Sons, Ltd., Pitman House, 39-41 Parker St., Kingsway, London, W.C.2, [n.d.].

Among the several books on the subject of anatomy for artists that have appeared in the last few years, Miss Stanley's volume is probably the least elaborate. The author apparently set out to provide a reference work for art students that would cover in a clear, simple fashion the gross bony and muscular structure of the human body and one that could be sold at a low price. The text is simple and clear and is confined largely to explanation of the illustrations. All of the illustrations are in black and white, most of them being halftones of crayon drawings done by the author. They depict clearly and accurately the anatomic structures that contribute most to surface form and appearance. A criticism might be offered of the method used in labeling the structures in the otherwise excellent plates, since ready identification of the structures is somewhat more difficult than with the standard labeling procedure. The usefulness of this book is enhanced by excellent arrangement of the material and by a good index. It should prove a valuable addition to the library of artists and sculptors.

The Science of Biology. By William C. Beaver, Ph.D., Head of Department of Biology, Wittenberg College, Springfield, Ohio. Fourth edition. Cloth. $5.85. Pp. 895, with 375 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1952.

This edition of this introductory text upholds the pattern set by earlier editions of presenting the essentials of biology in a systematized and condensed manner. In addition to being generously illustrated, it contains several appendixes, including a glossary of biological terms, principles and theories, and a list of important prefixes and suffixes used in biology. Selected references are listed at the end of each chapter.

Lehrbuch der Urologie und der chirurgischen Krankheiten der männlichen Geschlechtsorgane. Von Hans Wildbolz. Third edition edited by Privatdozent Dr. med. Egon Wildbolz, Chefarzt am Inselspital in Bern. Cloth. 120 marks. Pp. 612, with 233 illustrations. Springer-Verlag, Reichpietschufer 20, Berlin W. 35 (West-Berlin); Neuenheimer Landstrasse 24, Heidelberg; Göttingen, 1952.

This book has been regarded widely as an outstanding practical textbook on urology since the first edition was printed, 24 years ago. The author of the first two editions, the late Prof. Hans Wildbolz, was regarded as one of the greatest European urologists. The present edition is edited by his able son, who has retained the same general arrangement and classification of subjects present in previous editions and has continued the same sound discussion of the various lesions. This book does not attempt a detailed discussion of the various urologic fields as is found in that complete treatise on diseases of the genitourinary tract, the "Handbuch der Urologie" edited by Von Lichtenberg, Voelcker, and Wildbolz. Most of the references to other authors are confined to European authorities; in fact, many of the contributions made in recent years by American urologists are conspicuous by their absence or are only briefly considered. As in the other editions, those portions devoted to pathological anatomy and preliminary discussions of the various lesions are outstanding. One might wish, however, that the portion devoted to therapy had been given greater consideration, and, particularly, that the many therapeutic advances that have been suggested in recent American urologic literature had been included. Limitation of space probably explains a paucity of the urographic description that is so essential to diagnosis of lesions in the urinary tract. Taken as a whole, however, this book fulfills its purpose admirably, and one might wish that an English translation were available.

Signs and Symptoms: Applied Pathologic Physiology and Clinical Interpretation. Edited by Cyril Mitchell MacBryde, A.B., M.D., F.A.C.P., Associate Professor of Clinical Medicine, Washington University School of Medicine, St. Louis. Second edition. Cloth. $10. Pp. 783, with 156 illustrations. J. B. Lippincott Company, 227-231 S. Sixth St., Philadelphia 5; Aldine House, 10-13 Bedford St., London, W.C.2; 2083 Guy St., Montreal, 1952.

This edition appears within five years of the first edition, clearly indicating its popularity. The 26 contributors are all well known and have long been recognized for their leadership in the fields in which they are interested. According to the preface of the first edition, this book is intended to give the basis for analysis and interpretation of some of the commonest symptoms that bring patients to the physician. Emphasis is placed on the pathological physiology of the symptoms, which is correlated with other symptoms and with physical and laboratory evidence. The authors have succeeded remarkably well in following this principle, so that most persons if not everyone will agree with the opening sentence in the preface to the second edition, which reads: "This book approaches diagnosis in the same manner as the physician must when he is confronted by an ailing patient." Those who are familiar with the contents of the first edition need no introduction to the second edition. Those who have yet to become acquainted with this book have much to look forward to, whether they are interested in pain, headache, sore tongue and sore mouth, palpitation and tachycardia, cough, cyanosis, fainting, or itching, to mention just a few of the subjects covered in the 31 chapters. For quick reference and helpful information this book can be recommended unreservedly for practitioner and student.

Henry VIII: A Difficult Patient. By Sir Arthur Salusbury MacNalty, K.C.B., M.A., M.D. Cloth. 18s. Pp. 202, with portrait. Christopher Johnson Publishers, Ltd., 10-14 Stanhope Mews West, London, S.W.7, [n.d.].

In this biographic sketch, the author reviews one of the most controversial reigns in British history. In tracing the private life and political activities of Henry VIII, Sir Arthur MacNalty develops his thesis that the monarch's actions and behavior were the consequences of his ever-deteriorating state of health. In addition, the text contains interesting sketches on medicine and medical men in Tudor England.

Reducing Cookbook and Diet Guide. By Llewellyn Miller. Introduction by Dr. James R. Wilson, Secretary, Council on Foods and Nutrition, American Medical Association, Chicago. Foreword by Frances M. Telsey. Cloth. $2.75. Pp. 262, with illustrations by Ava Morgan. Thomas Y. Crowell Company, 432 Fourth Ave., New York 16, 1952.

This is a fine book for persons who like to eat but do not like the inevitable consequences. It starts out with a brief discussion of how we eat and how food contributes to figures that require no further contribution. Simple and practical weight tables are given, as well as instructions on how one can eat as much as desired and still lose weight. It is quite unlike the usual book on reducing with a title promising everything and actually offering only disillusionment. After the preliminaries have been disposed of, there is a helpful section on seasonings; then come recipes, beginning with those for drinks and including such things as canapes, soups, and fish. Spaced throughout the book are sketches of a scale tipped down on one side, with a high calory food such as ½ cup of codfish, creamed on toast (250 calories), and on the other arm of the scale a codfish steak, steamed (100 calories). A quick perusal of the recipes indicates that the author knows not only food and food values but also how to cook.

The Enzymes: Chemistry and Mechanism of Action. Volume II, Part 2. Edited by James B. Summer and Karl Myrbäck. Cloth. $14. Pp. 791-1440, with illustrations. Academic Press, Inc., 125 E. 23rd St., New York 10, 1952.

This is the final part of a two volume, four part series on the chemistry and the mechanism of the action of enzymes. The various chapters are again written by authorities chosen because of their knowledge of particular fields. The subjects in this volume comprise a rather heterogeneous group of enzymatic syntheses and reactions. Among the syntheses discussed are those of urea, glutamine, acetylcholine, and the peptide bond. Other subjects include bacterial fermentation, detoxication, oxidative assimilation by micro-organisms, enzymatic mechanisms of carbon dioxide fixation, carbohydrate-fat conversion, bacterial photosyntheses, photosyntheses in green plants, nitrogen assimilation, and tumor enzymology. A final lengthy chapter on enzyme technology is also included. The various chapters have footnotes with appropriate references, and the book includes the author and subject indexes for both parts 1 and 2 of volume 2.

Public Relations. By Edward L. Bernays. Cloth. $5. Pp. 374. University of Oklahoma Press, Norman, Oklahoma, 1952.

One challenge facing physicians today is that of living up to their ethics and letting the public know about it. This, in brief, is medical public relations. According to the author of this book (a nephew of Sigmund Freud and a former medical writer), medical public relations can be defined as: "(1) information given to the public; (2) persuasion directed to the public to modify attitudes and actions; and (3) efforts to integrate attitudes and actions with the public." This book makes it clear that public relations is not publicity, press agentry, promotion, advertising, or a bag of tricks, but a developing science with its own high code of ethics. Bernays' purpose is to acquaint physicians and others with this new science and how it can be used to gain a more favorable public opinion. Both as a handbook of public relations techniques and as an introduction to this science, physicians should find this book useful.

Genetics and Disease. By Tage Kemp, M.D., Professor of Human Genetics, University of Copenhagen, Copenhagen. [Translated from Danish by Elisabeth Aagesen.] Cloth. 30 Danish crowns. Pp. 330, with 100 illustrations. Ejnar Munksgaards Forlag, Nørregade 6, Copenhagen K, 1951.

This comprehensive text is divided into five sections. The first section, on the basis of heredity, consists of 12 chapters devoted to a review of the fundamental principles of genetics. The second section, which is much more brief, defines the scope and methods of medical genetics. The third section discusses the inheritance of morphological and physiological traits, blood groups, psychic traits, and constitution and constitutional types. The remaining two sections deal with hereditary diseases and genetic hygiene, respectively, and should be of particular interest to the clinician. The book is amply documented with photographs, charts, and pedigrees.

QUERIES AND MINOR NOTES

ADOPTING A BABY

To the Editor:—*A friend asked me about adoption of a baby by her daughter and son-in-law, who reside in California. He is an engineer and is often transferred to a new location after one or two years. They have applied for a baby for adoption in California and have been told that it will take three to four years. The wife is 30 years old and has had three abortions during the first trimester. What agencies might be able to provide a child for these people?* *M.D., Illinois.*

Answer.—First, legal advice is essential in adoption proceedings, as it prevents many of the regrettable episodes that occur incident to such procedures and also clarifies the varied state legal requirements. Second, there is no single agency that one can consult, but many cities have such agencies and they can easily be found through welfare agencies. Third, one of the best and usually quickest ways to secure a baby for adoption is to consult local obstetricians or hospitals. In this way, often the background of the baby is better known. A pediatrician should examine the baby, and a lawyer should arrange all of the adoption procedures. There are lawyers who specialize in this work.

BACTERIAL MENINGITIS

To the Editor:—*Is it permissible to give dihydrostreptomycin intrathecally in the treatment of the appropriate type of bacterial meningitis? I understand that streptomycin only should be used.* *Edward S. King, M.D., Shelby, N. C.*

This inquiry was referred to two consultants, whose respective replies follow.—Ed.

Answer.—"New and Nonofficial Remedies" (Philadelphia, J. B. Lippincott Company, 1952, page 131) states: "The sulfate [of dihydrostreptomycin] may be given by the intrathecal route in doses not to exceed 1 mg. per pound of body weight up to 50 pounds [22.7 kg.] of weight. It may be given daily or on alternate days. Intraspinal therapy is rarely indicated in any condition other than tuberculous meningitis."

Answer.—Although it has been stated that dihydrostreptomycin should not be given intrathecally, this agent has been given by this route in repeated injections to many patients on this consultant's service. No untoward reactions have been noted when quantities no greater than 100 mg. have been administered to adults.

DRYING OF LIPS AND TONGUE IN CHRONIC ILLNESS

To the Editor:—*In a hospital having a large neuropsychiatric service, quite a few patients who have been in prolonged catatonic, comatose, or paralytic states are found at autopsy to have a lipid pneumonia. A compound used on the lips and tongue to prevent drying has been blamed as the source of the lipid material. It has the following components: boric acid, 110 parts; mineral oil, 250 parts; petrolatum, 250 parts; oil of nutmeg, 2.25 parts; oil of lemon, 10 parts. I believe it is often used in excess. What innocuous substance could be used to prevent drying and cracking of the lips and tongue during prolonged illnesses of this type?* *M.D., Pennsylvania.*

Answer.—It may be that the application to the lips of aquaphor,® either undiluted or diluted by 25% with water, would serve the purpose. Another preparation that has been used successfully for years consists of salicylic acid 0.3 parts, compound benzoin tincture 2 parts, hydrous wool fat (lanolin) 4 parts, and rose water ointment, enough to make 30 parts.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

CONGENITAL HEART DISEASE

To the Editor:—*A young couple had two sons with congenital heart disease. The couple consulted me about having another child. I told them it was improbable that they would have another child with congenital heart disease. Two months ago, their third child was born, "a blue baby." The congenital cyanosis continues. I would appreciate your explanation of three consecutive sons born with congenital cardiac anomalies.* *M.D., Brazil.*

Answer.—It is extremely rare for three children in one family to have congenital heart disease, but when this occurs it is probably due to an abnormality in the genes. Further pregnancies definitely are not recommended. A single case of a congenital anomaly of the heart is relatively common, and there are many families in which there have been previous or subsequent normal pregnancies. There are a few families in which there have been two children with congenital malformations of the heart and other subsequent normal pregnancies, and there are a few families in which there is such a high incidence of congenital abnormality of the heart that it appears to be hereditary. Drs. Walker and Ellis (Walker, G. C., and Ellis, L. B.: "The Familial Occurrence of Congenital Cardiac Anomalies." Proceedings, New England Heart Association, 1940-41, pp. 26-27) reported a case in which the father and four of his eight children had a patent ductus arteriosus. This consultant has seen one in which the father and two of his three children and one of his grandchildren had patent ductus arteriosus. Such instances seem to be the exception. This consultant always recommends that a patient who has had one child with an abnormal heart have subsequent pregnancies.

BLOOD SUGAR LEVEL DURING PREGNANCY

To the Editor:—*Two pregnant women had a peculiar severe type of vomiting during the first half of pregnancy, and the usually successful treatment failed to help them. Lugol's solution, 10 drops three times a day gave gratifying results. What is the average blood sugar level during pregnancy? What are the comparative values of the blood cholesterol and basal metabolic rate determinations in estimating thyroid activity?* *M.D., Michigan.*

Answer.—Blood sugar levels rise from 10 to 20% during pregnancy. The presence of sugar in the urine, if it continues, should be checked with glucose tolerance tests, and any patient who has an unusually large baby should be checked carefully for signs of early diabetes. Comparatively, the cholesterol determination is more accurate in estimation of thyroid activity than is the basal metabolic rate determination, because it is not dependent on emotional or other factors, but each is good as a check on the other.

HEBERDEN'S NODES

To the Editor:—*Is there anything new in the treatment of hypertrophic arthritis occurring at or after menopause in which there is no clinical evidence of arthritis except Heberden's nodes at the finger joints?* *J. J. Blue, M.D., Cedarville, Mich.*

Answer.—It is true that Heberden's nodes are usually associated and characterized as being one form of degenerative joint disease (osteoarthritis or hypertrophic arthritis). Actually, however, there is now considerable evidence that these nodes are hereditary and are not an indication of degenerative joint disease. They do not respond to hormone treatment. Assurance should be given to the patient that this does not constitute a serious illness and that simple protection of the fingers from trauma received in gardening and housework will minimize the inconvenience of Heberden's nodes.

HABITUAL ABORTIONS

TO THE EDITOR:—*I have a case on which I would like some help. A 33-year-old woman, in good health, has a 7-year-old boy and has had three miscarriages during the past two years. During the first, she received no specific therapy; during the second, she received 25 mg. of diethylstilbestrol daily; during the last, she received gradually increasing amounts of diethylstilbestrol, 5 to 15 mg. daily, and progesterone, 25 mg. daily for several days. All miscarriages have occurred prior to two and one-half months of pregnancy. She has a basal metabolic rate of +4 and her blood condition is normal. Would further trials of pregnancy result in any change? Would other therapy, such as administration of chorionic gonadotropin (antuitrin® S), be of any help? She would like to have more children.*

Walter L. Blackadar, M.D., Salmon, Ida.

ANSWER.—It would be wise to obtain a hysterogram to make certain there is no abnormality in the uterus, such as a congenital abnormality or a submucous myoma, causing the habitual abortions. Sometimes curettage helps to preserve future gestations. An unbiased opinion of the results of therapy in cases of habitual abortion shows that it does not really matter whether women receive estrogens, progesterone, thyroid, or other therapy to prevent repeated abortions. Greenhill (Principles and Practice of Obstetrics, Philadelphia, W. B. Saunders Company, 1952) suggests that rest, but not necessarily in bed, and abstinence from coitus should be prescribed around the time that menstruation would ordinarily be expected. Patients with threatened abortion should adhere to this type of rest for four lunar months and those with histories of habitual abortion for eight months. Basal metabolism studies and cholesterol determinations should be made to determine whether thyroid therapy is needed. If thyroid is required, a sufficient dose should be prescribed. If possible, the blood iodine content should also be determined. In a case of threatened abortion, a Guterman or a Venning Browne test should be performed; if the result is normal, there is no reason for giving progesterone. If these tests show a lack of or a decrease in pregnanediol excretion, at least 75 to 100 mg. of progesterone must be administered hypodermically each day. In view of the report by Sommerville, Marrian and Clayton, this consultant will withhold diethylstilbestrol from patients with threatened and habitual abortion until the various investigators come to some agreement.

ERYTHROBLASTOSIS AMONG NEGROIDS

TO THE EDITOR:—*I have delivered many Negro women, but so far I have never found one to be Rh negative. Is this a general observation?*

Walter Newman, M.D., Springfield, Mass.

ANSWER.—The observation that typical erythroblastosis due to Rh sensitization appears to be relatively rare among Negroids in contrast to Caucasoids agrees with the experiences of other investigators. This is due, at least in part, to the lower frequency of Rh-negative persons among Negroids. Among Caucasoids, 14 to 17% of all persons are Rh negative. Among Negroids, the incidence is variously reported to be only 5 to 10%. According to Scott and co-workers, among 3,615 Negroes at the Freedman's Hospital, Washington, D. C., 7.1% were Rh negative, while among 1,000 Negro blood donors at the Gallinger Municipal Hospital, Washington, D. C., 6.5% were Rh negative. According to Sacks and co-workers, among a series of more than 11,000 American Negroes, 8.3% were Rh negative. Based on these observations, the chances of Rh sensitization occurring among Negroids would be less than one-half the chances of its occurring among Caucasoids. When allowance is made for the difference in incidence of Rh-negative persons, Rh sensitization in pregnancy is found to occur among Negroes at the expected rate; for example, Waller and Waller report that among Rh-negative persons, the incidence of Rh sensitization is 4% for both Negroids and Caucasoids. Similar findings are reported by Sacks and co-workers, who tested 1,302 Rh_o-negative Negro patients and found 77 (4.9%) instances of Rh sensitization, while among 8,889 Rh_o-negative Caucasoids, they found 460 (5.2%) instances of Rh sensitization, so that the difference in rate of Rh sensitivity among Rh-negative Negroids and Rh-negative Caucasoids is not statistically significant.

While sensitization of Rh-negative persons occurs at the expected rate in Negroids, typical erythroblastosis caused by Rh sensitization has been encountered much less frequently than is to be expected. Thus far, most of the cases of erythroblastosis in Negroids encountered by Wiener and Wexler and by Scott and co-workers have proved to be due to A or B sensitization rather than Rh sensitization. Waller and Waller suggest the following possible explanations for this observation: 1. Not all the immunized mothers have sufficiently potent Rh antibodies to produce clinical symptoms in their offspring. 2. The pigmented skin makes the diagnosis of icterus and anemia difficult. 3. At some institutions, Negro multiparas leave the hospital after 24 to 48 hours, removing the babies from observation during the period when symptoms may develop. 4. Autopsy is not done on many stillborn babies, and erythroblastosis in such cases would remain undiagnosed. 5. Severe jaundice was unusual and severe anemia rather common in the group studied by Waller and Waller, so that many of these cases may have been diagnosed in the past as merely anemia of the newborn. Enough data are not yet available to establish definitely whether erythroblastosis caused by Rh sensitization tends to be milder in Negroids. If this impression is confirmed by further observation, the problem would be worthy of intensive study, because it may disclose some of the accessory factors (aside from the Rh antigen-antibody combination itself) affecting the severity of the manifestations in erythroblastotic babies.

CONGENITAL TOXOPLASMOSIS

TO THE EDITOR:—*What is the likelihood of toxoplasmosis occurring in future offspring of a mother who had a serum antibody titer of 1:60 several months after giving birth to her first child, who has chorioretinitis, calcifications in the cerebrum, and a small head? There are no apparent signs of disease activity in the mother. The affected child at the age of 1 year has a head circumference of 15¾ in. (40 cm.) but is grossly normal mentally and physically. Would she be considered microcephalic?*

Jacob Greenblatt, M.D., Stamford, Conn.

ANSWER.—The important issue here is whether the chorioretinitis, cerebral calcification, and microcephaly of the child are due to congenital toxoplasmosis or to some other cause. Congenital toxoplasmosis cannot be diagnosed serologically on the basis of any titer of antibody in a mother's serum without knowledge of what the antibody content is in the serum of the child. The report that the mother's serum had an antibody titer of 1:60 is not helpful without knowledge of whether the antibody referred to is complement-fixing antibody or the cytoplasm-modifying antibody measured by the dye test of Sabin and Feldman (*Science* **108**:660, 1948). If the titer of 1:60 in the mother's serum refers to complement-fixing antibody and the child's serum also shows a high titer of antibodies, a diagnosis of congenital toxoplasmosis is warranted. If it is the dye test antibody, then a titer of 1:60 several months after giving birth to a baby with cerebral and ocular damage is not compatible with a diagnosis of congenital toxoplasmosis in the child. Mothers giving birth to children with congenital toxoplasmosis only rarely show titers as low as 1:256 during the first two years after delivery, and, as a rule, the dye test titers are 1:1,000 or higher. If it can be established, therefore, that the mother's serum has a titer of dye test antibody in the range of 1:60, it would be expected that the child tested at 4 months of age or later would have no antibody at all against Toxoplasma. Under these circumstances the diagnosis of congenital toxoplasmosis cannot be made, despite the presence of chorioretinitis and cerebral calcification. Sabin and Feldman (*J. Pediat.* **35**:296, 1949) reported that the classical tetrad of congenital toxoplasmosis, namely, chorioretinopathy, cerebral calcification, hydrocephalus or microcephaly, and psychomotor disturbances, can be produced congenitally or in the neonatal period by conditions other than toxoplasmosis.

The establishment of whether such manifestations of cerebral and ocular damage are due to toxoplasmosis is important chiefly

in relation to the prognosis for subsequent children. Sabin and Feldman first indicated that mothers who had given birth to children in whom the diagnosis of congenital toxoplasmosis was unequivocal invariably gave birth to normal children subsequently at a time when they still showed high titers of dye test and complement-fixing antibodies. Since then, Dr. H. A. Feldman, now at The University Hospital of The Good Shepherd of the State University of New York at Syracuse, and Dr. H. Eichenwald, working at the New York Hospital in New York, have together accumulated information on an additional 44 mothers who, after giving birth to children with proved congenital toxoplasmosis, had 66 subsequent pregnancies. Toxoplasmosis was not found in any of the subsequent children. (This information will soon be published in a report by the Committee on Toxoplasmosis, Tropical Medicine Study Section, Division of Research Grants, National Institutes of Health, United States Public Health Service). Other conditions responsible for congenital types of cerebral and ocular damage simulating those of toxoplasmosis carry an uncertain prognosis for subsequent children, since multiple abnormal children have appeared in the same family. A head circumference of 15¾ in. at 1 year of age is smaller than average, but, unless the chest circumference is much larger than this, it cannot be considered to be indicative of microcephaly.

OSTEOARTHRITIS

To the Editor:—*A 48-year-old man has been diagnosed roentgenographically as having cervical arthritis involving the articulation between vertebrae C5 and C6, with anterior and posterior lipping and a narrowing of the interspace. There is a possible history of trauma to account for this condition. At present, excessive shoulder or neck motion aggravates symptoms, which are referable to nerve roots in this area. For the past few months the patient has been annoyed by a twitching sensation just posterior to the lower end of the sternum, which is most noticeable about the time bowel action is imminent. He states that for the past 15 months his xiphoid process has been tender to pressure. For the past two months he has been further annoyed by irregular intermittent "dropped beats," although both the electrocardiogram and ballistocardiogram are normal. There is a mild elevation of blood pressure. Are these symptoms the result of the pathological condition described? If so, I would appreciate information on the mechanism involved and advice on the prognosis in this case.*

M.D., Wisconsin.

Answer.—Roentgenographic evidence of osteoarthritis in the cervical spine may be taken as fair evidence that this person has generalized osteoarthritis. This assumption may be made because osteoarthritis is frequently recognizable in the cervical spine before roentgenographic evidence of this disorder may be found elsewhere. It would be reasonable to expect therefore, that this patient might experience sensations of pain and stiffness elsewhere than in the cervical spine. Twitching sensations at the lower end of the sternum, noticeable about the time of bowel action, would not be a manifestation of osteoarthritis. Tenderness about the sternum or about the xiphoid process is frequently encountered in patients with osteoarthritis. It is believed to represent fibrositis or fascitis of insertions of muscles into the sternum. This symptom has no other significance in osteoarthritis. The occasional occurrence of extra systoles has no special significance in osteoarthritis, and if there is no other clinical evidence of heart disease, this may be disregarded.

Only general principles of proper treatment of osteoarthritis may be reviewed in this reply. A most important treatment measure for patients with osteoarthritis is reassurance as to the nature of this condition. Differences between rheumatoid arthritis and osteoarthritis should be carefully reviewed with the patient so that crippling and serious disability will not be anticipated needlessly. Generally, simple treatment measures suffice for osteoarthritis. Regulated periods of rest, supports for affected areas, physical therapeutic measures, and simple analgesic drugs are useful treatment measures. Patients with osteoarthritis of the cervical spine should be taught to sleep with pillows placed in a manner to relax the neck muscles. Some patients obtain considerable comfort from wrapping the neck with an elastic cotton bandage at bedtime. Useful physical therapeutic measures include applications of heat from infrared bulbs, hot compresses, and electric pads. Heat should be applied for periods of 20 to 30 minutes once or twice daily, depending on the severity of the symptoms. In addition, massage may favor relaxation of affected muscle groups. Exercises should be avoided. Useful medicaments include sodium salicylate in doses of 10 grains (0.65 gm.) repeated at three or four hour intervals as necessary and, also, phenobarbital in doses of ¼ to 1 grain (0.015 to 0.06 gm.) at bedtime to encourage rest. Treatment of osteoarthritis by means of cortisone and adrenocorticotropic hormones is under study, but a final opinion as to the value of this procedure is not yet available.

REGIONAL ENTERITIS

To the Editor:—*A 36-year-old engineer lost 15 lb. (6.8 kg.) of body weight during a four week period last summer. There were no other symptoms at that time. Five months ago, after a series of upper respiratory tract infections, he began to have four to five watery, nonbloody stools per day. A gastrointestinal series showed regional enteritis involving the terminal 12 in. (30.5 cm.) of the ileum. Review of a gastrointestinal series done elsewhere in 1946 showed a distinct "string sign" involving the last 2 in. (5.1 cm.) of ileum, erroneously interpreted at that time as representing the appendix, although the patient's appendix was removed 20 years ago. During the intervening time, the patient was asymptomatic, until the above events occurred. Treatment has consisted of alternating courses of phthalylsulfathiazole (sulfathalidine®), 4 gm. daily for three weeks, and chloromycetin, 2.5 gm. daily for one week. If these drugs are discontinued or reduced in dosage, diarrhea and weight loss occur. While receiving these drugs, the patient has one or two formed stools daily and no symptoms, except afternoon fatigue. The patient has severe allergic rhinitis from May to October. Is there any treatment preferable to that being used? Can the present therapy be continued indefinitely? Would a trial of cortisone be advisable? Is there an emotional component to this disease similar to that seen in ulcerative colitis?*

M.D., New York.

Answer.—Regional enteritis is essentially a chronic disease often starting in young adult life and characterized by repeated episodes of recurrence and remission, the latter usually but not always related to treatment, either surgical or medical. More knowledge of the disease is needed to improve the long range results. In the case described, the observations seem to justify a clinical diagnosis of regional ileitis, although it should be pointed out that an accurate anatomical diagnosis can be made only by exploratory operation, which, by permitting direct inspection and palpation, reveals the degree of disease, including the presence or likelihood of obstruction and/or perforation, as well as the extent, including the presence of "skip" areas in the small and even in the large gut. A surgical procedure, either resection or exclusion, should be carried out only in the face of sufficiently severe localized disease, especially if it is the site of either obstruction or perforation. At times, operation will reveal a lesion other than regional ileitis, such as neoplasm, for which a curative procedure can be done. If at operation, mild or diffuse disease is found, the abdomen should be closed without any definitive procedure.

Whether operation is carried out or not, the day to day care of the patient is most important. Nutritional rehabilitation must be achieved even if special devices such as a period of tube feeding or parenteral feeding, are necessary. Chemotherapy also has its place as does hormonal therapy (testosterone, corticotropin, and cortisone). Since the results are so equivocal, these methods should always be looked on as experimental and should be continued or repeated only if objective benefit follows.

Despite some opinions to the contrary, in this consultant's opinion, psychogenic factors also play an important part in this disease (as indeed they do in many diseases). Moreover, isolated case reports of treatment by vagotomy suggest that surgical interruption of cephalic impulses to the gastrointestinal tract in this way may have a place in the late cases, especially in cases in

which, after repeated resections, only a small limb of healthy jejunum remains. It must be admitted, however, that without knowledge of a specific cause, the best results will be obtained only when the patient rather than the disease is treated, using all therapeutic means, including surgery. In the case described, emotional factors should be investigated by the patient's personal physician, with the idea of controlling them and thus producing a permanent remission. Although there is nothing wrong with continuing the present regimen, it is probably unsound to continue chemotherapy indefinitely, especially since it is likely that loss of sensitivity may soon render the drugs ineffective. Operation, finally, must be seriously considered for the reasons discussed.

MEDIAN THENAR NEURITIS

To the Editor:—*A man, 78 years old, 5 ft. 7 in. (170.18 cm.) tall and 130 lb. (59 kg.) in weight, has numbness, prickling, and tingling in his right hand on the palmar surfaces of the first three digits. The sensation to a pin prick is dull on these digits and sharp on the fourth and fifth digits. This has become almost constant and is worse at night. It is improved when the hand is supinated and is made worse by pronation. The patient is sometimes able to get relief at night by lying on his back with the hand palm up on the pillow above his head. I had him apply extension to the head with traction apparatus every night for six weeks. He used a 10 to 15 lb. weight and kept it on most of the night, with no benefit. He has taken large doses of vitamin B complex as well as mixed vitamin preparations. He is active, and has no heart, chest, abdominal, or prostatic difficulties. His blood cell counts, nonprotein nitrogen and blood sugar levels, basal metabolism, and electrocardiogram are normal, and his reaction to the Wassermann test is negative. He has a slight scoliosis in the upper dorsal region as revealed by roentgenographic examination. What is your opinion regarding this condition?*

M.D., Wisconsin.

This inquiry was referred to two consultants, whose respective replies follow.—Ed.

Answer.—Paresthesias on the palmar surface of the first three digits of the right hand would be indicative of some irritative process involving the innervation of the area. In view of the distribution in this case and the fact that it is affected by pronation of the wrist, there may be a lesion of the median nerve. It is possible, of course, that the irritating lesion may lie intraspinally, although that is less likely. Without a more complete investigation than that reported here, it would not be possible to arrive at a positive diagnosis. It is suggested that such a neurological investigation be made.

Answer.—The syndrome described is known under various names; these are median thenar neuritis, tardy median palsy, compression in the carpal tunnel, and, when atrophy of the thenar muscle is a prominent feature, partial thenar atrophy. First suggested in 1909, it was not until 1946 that full recognition was given to this form of neuritis. In that year, the symptoms, mechanism, progress, and treatment were depicted by Cannon and Love in America and a year later by Brain, Wright, and Wilkinson in England. The symptoms arise from compression of the median nerve in the wrist by the transverse carpal ligament, the maximum pressure usually occurring at the proximal edge of the ligament. The nerve at this point, when exposed surgically, presents a fusiform swelling, clearly shown in the illustration accompanying the papers by Cannon and Love and by Brain and his associates. The motor branch of the median nerve to the thenar muscles, arising beneath the carpal ligament, may or may not be compressed, which accounts for the variation in the amount of thenar atrophy observed clinically. In most cases the primary symptom is a sensory abnormality, as in the case described.

Treatment is entirely surgical. The nerve is almost subcutaneous and is easily found after the carpal ligament is cut through along its entire length. The nerve is then freed and returned to its bed in the carpal tunnel. Neurolysis may be indicated, but many good results have been reported with simple decompression. The diagnosis is usually easy to make. The area of sensation disturbed clearly indicates involvement of the median nerve, and thenar atrophy, if present, confirms this assumption. In progressive muscular atrophy, often beginning in the hands, there would be no sensory involvement. Costoclavicular syndromes, such as pressure from a cervical rib, are more difficult to differentiate, but in most cases of median nerve lesions above the level of the wrist, motor symptoms are more prominent than sensory symptoms and muscles supplied above the carpal ligament are frequently paralyzed and atrophied. In some instances, antecedent fracture or injury to the wrist may be found and deformities may be demonstrated by roentgenograms, but many cases arise without previous demonstrable traumatic injury. The condition may be bilateral. The query suggests a sign not emphasized in previous literature, that the condition is made worse by pronation of the hand.

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"JITTER LEGS"

To the Editor:—*A physician is frequently called on to see patients who complain of nocturnal "jerking" of the lower extremities that interferes with their rest. This is clearly distinguished from nocturnal cramping, which is relieved by quinine therapy, and it is not accompanied by evidence of peripheral vascular disease or abnormal results of blood tests. Sedation seems to have little effect. Is there an effective remedy for this distressing complaint?*

Ferrall H. Moore, M.D., Redwood City, Calif.

Answer.—Nocturnal jerking, known as "jitter legs," is truly different from night cramps. Results of examination of the nervous and vascular systems invariably are normal. In one patient the symptom has been present for over 20 years without progression or amelioration. This recurring habit pattern reminds one of facial tic or writer's cramp, which lack an organic basis. Priscoline® (2-benzyl-2-imidazoline hydrochloride) has been said to be of benefit by Ekbom (Restless Legs, *Acta med. scandinav.* supp. 246, pp. 64-68, 1950), who has collected 70 such cases.

SYPHILIS AND PREGNANCY

To the Editor:—*A patient who is three months pregnant was found to have syphilis in a routine examination in 1946. She was treated for seven days with penicillin injections given every three hours. The dose of the penicillin injections is not known. She also received hip and arm injections for two or three months. All this treatment was given in another state. She had a negative reaction to the Wassermann test one year ago. At present, her reactions to both the Kline and VDRL (Venereal Disease Research Laboratory) tests are positive. In view of her present pregnancy and the positive reactions to syphilis tests, should she receive additional antisyphilitic therapy at this time?*

M.D., Arizona.

Answer.—This patient should receive 4,800,000 units of penicillin. It can be administered in any of several ways according to the convenience of the patient: 600,000 units daily or twice each week or 1,200,000 units once a week for four injections.

LEAD-FREE PAINT

To the Editor:—*Can you recommend a paint that does not contain lead and that would be suitable for painting a baby bed? We want to use white or ivory enamel.*

Frank H. Richardson, M.D., Black Mountain, N. C.

Answer.—Today, the use of lead-free interior paints is the rule and not the exception. The white pigment is likely to be titanium dioxide or lithopone, both of which are essentially harmless. For additional safety precaution, the purchaser should specify "white enamel" to avoid the possibility of being given lead-containing exterior paint.